DOCTORAL DISSERTATION

Social Software as a Source of Information in the Workplace

-

Modeling Information Seeking Behavior of Young Professionals in Management Consulting

by

Matthias Görtz,

born May 15th, 1981 in Freiburg, Germany

A DISSERTATION SUBMITTED IN PARTIAL SATISFACTION OF THE REQUIREMENTS FOR THE DEGREE OF

DR. PHIL.

DEPARTMENT III – LINGUISTICS AND INFORMATION SCIENCE

UNIVERSITY OF HILDESHEIM

Supervisors: Prof. Dr. Christa Womser-Hacker
Prof. Dr. Thomas Mandl
Date of submission: May 30th, 2011

Abstract

The rising popularity of the *social web* and the associated change of static websites and their content towards open platforms of social sharing, collaboration, and user-generated data confront knowledge-intensive business service providers with the question what role *social software* plays as a source of professional information in the workplace. Due to the high affinity and familiarity of young internet users with such services, it needs to be analyzed whether and, if yes, how employers need to adapt their electronic information environments to the expectations and behaviors of job entrants.

In the course of this doctoral dissertation of information science this problem is addressed in a specific context of use and scientific research environment. The information seeking behavior of young professionals in management consulting is analyzed by assessing the fit of existing analytical and process models of information seeking in regards to the research interest of this thesis and their validity for the context of use. This is achieved through qualitative observation and semi-structured interviews. The identified shortcomings and criticism of existing research results in the development of a task-specific model of information seeking that enables the design of a context-specific online survey of the information source usage of the examined population (n = 115).

The results of this multi-layered methodical approach show that in spite of the identified potential of external wikis and social intranet sites to serve as sources of *social* information, particularly for supporting young professionals in management consulting in gathering an overview of existing sources and evaluating the retrieved information and its quality, the high frequency of use of social web services for private purposes is not transferred to the usage for professional purposes. In the course of a leadership workshop measures for leveraging the realization of the identified potential are derived and aligned to the process of task-based information seeking behavior of young professionals. This leads to the reflection of context-specific challenges and conflicting interests of including social software as a source of information from a management perspective.

Keywords: [information seeking behavior], [social software], [social web], [management consulting], [electronic information environment]

Zusammenfassung

Die steigende Popularität des *Social Web* und der damit verbundene Wandel von statischen Webseiten und -Inhalten hin zu offenen Plattformen sozialen Austauschs, kollaborativer Prozesse und nutzergenerierter Daten stellt insbesondere Organisationen wissensintensiver Dienstleister vor die Frage, welche Rolle *Social Software*-Anwendungen als Quelle berufsbezogener Information am Arbeitsplatz spielen. Aufgrund der hohen Affinität und Vertrautheit junger Internetnutzer zu derartigen Diensten gilt es zu analysieren, ob, und wenn ja, wie Arbeitgeber ihre elektronische Informationsumgebung an Erwartungshaltungen und Arbeitsverhalten von Berufseinsteigern anpassen sollten.

Im Rahmen der vorliegenden informationswissenschaftlichen Dissertation wird dieser Fragestellung in einem spezifischen Anwendungskontext und wissenschaftlichen Forschungsumfeld nachgegangen. So wird das Informationssuchverhalten von jungen Berufseinsteigern in der Unternehmensberatung untersucht. Dabei werden bestehende Modelle der Information-Seeking-Forschung anhand von qualitativen Beobachtungen und semi-strukturierten Interviews kritisch analysiert und auf ihre Gültigkeit für den Untersuchungskontext und das Forschungsinteresse geprüft. Das anschließend eigens entwickelte Modell aufgabenspezifischen Informationssuchverhaltens ermöglicht die Gestaltung eines kontextbasierten Online-Fragebogens zur Erhebung der Nutzung von Informationsquellen der untersuchten Zielgruppe (n = 115).

Die daraus resultierenden Ergebnisse zeigen, dass trotz des Potenzials externer Wikis und interner Social-Software-Anwendungen, Nutzer am Arbeitsplatz als Quelle *sozialer* Information insbesondere für die Identifikation relevanter Quellen sowie der Evaluation gefundener Information und ihrer Qualität zu unterstützen, das intensive private Nutzungsverhalten des Social Web sich kaum in der berufsbezogenen Nutzung widerspiegelt. In einem Experten-Workshop werden Maßnahmen zur Realisierung des identifizierten Potenzials entwickelt und entlang des Prozesses aufgabenspezifischen Suchverhaltens junger Berufseinsteiger strukturiert. Dabei werden kontextspezifische Herausforderungen und Interessenskonflikte aus Perspektive der Personalführung reflektiert.

Schlagwörter: [Informationssuchverhalten], [Soziale Software], [Social Web], [Unternehmensberatung], [Elektronische Informationsumgebung]

Acknowledgements

> "*Context is not simply the state of a predefined environment with a fixed set of interaction resources. It's part of a process of interacting with an ever-changing environment composed of reconfigurable, migratory, distributed, and multiscale resources.*" (Coutaz et al. 2005)

As I do not grow tired of saying "context is key", I would like to acknowledge that this does not only apply to the understanding of social software as a source of information in the workplace. It is even more valid for the process of seeking information and, ultimately, writing a doctoral dissertation.

I am deeply grateful to all of those that make my professional and private context a wonderful interactive mix of inspiration, guidance, encouragement, and critical feedback. The following pages would never have been written without the unconditional trust, tireless support, and constructive feedback from a variety of institutions, colleagues, friends, and family.

The *University of Hildesheim*, *Accenture Management Consulting*, and *Cusanuswerk* have enabled me to follow my research interests and work plan by providing the required resources, infrastructure, and access to a wide range of intelligent and interesting people.

I am thankful to Professors Christa Womser-Hacker and Thomas Mandl for their feedback and guidance as my supervisors. It has been a great motivation to see how both have devoted themselves to the topic and guided me to the interfaces with their original home turfs in IR and HCI. The exchange of ideas with Folker Caroli, Joachim Griesbaum, Ralph Kölle, and all other members and doctoral candidates of the *Institute of Information Science and NLP* served as important inspiration and motivation during my time at Bühler-Campus.

Furthermore, I am grateful for all the support, coaching, and feedback from Norbert Büning, Tobias Sattler (both Accenture), and Katriina Byström (University of Borås). While Norbert and Tobias did everything to help me set-up and run this project without questioning its success, Katriina encouraged me to dive deeper in the field of information seeking than I had ever anticipated.

In the final process of writing, I was glad to know the native speakers Penelope Murdock and Cathy Dumas (SUNY) by my side. They helped me

make this publication accessible to a wide audience. All remaining errors were most probably added after their final proofread.

Finally, I am glad that the above statement from Coutaz et al. does not necessarily apply for my private context. It was due to the never-changing environment consisting of my beloved wife, Miriam, and my daughter, Pauline, my father, Heinz-Jürgen, my mother, Marita, my sisters, Katharina and Johanna, Arne and Anja, Jutta and Jo, many more members of the extended family, and last but not least my highly esteemed thought sparring partner, Niclas, that this dissertation has come to a positive ending. Thank you very much for providing food and shelter, bearing with me in times of doubt, tolerating moments of mental absentness, and always being there when needed.

Frankfurt, October 2011
Matthias Görtz

Table of Contents

*) http://www.vwh-verlag.de/vwh/?p=693.

List of Figures

List of Tables

List of Abbreviations

AMC	Accenture Management Consulting
ASG	Austria, Switzerland, Germany
ASK	anomalous state of knowledge
cf.	Latin: ‘confer’ / English: ‘compare’
CBDT	case-based decision task
CRM	customer relationship management
e.g.	Latin: ‘exempli gratia’ / English: ‘for example’
et al.	Latin: ‘et alia’ / English: ‘and others’
EWI	external wikis
FI	factual information
F&PM	finance & performance management
HCI	human-computer interaction
HR	human resources
i.a.	Latin: ‘inter alia’ / English: ‘amongst others’
i.e.	Latin: ‘id est’ / English: ‘that is to say’
ibid.	Latin: ‘ibidem’ / English: ‘in the same place’
IDT	investigative decision task
IET	information extracting task
IKS	intranet knowledge sources
INSU	information needs, seeking and use
IR	information retrieval
ISB	information seeking behavior
ISE	internet search engines
IS&R	information seeking & retrieval
ITS	instructed training sources
KIBS	knowledge-intensive business services
KPI	key performance indicator
LIS	library & information science
M	arithmetic mean
NA	North America
PCS	personal contact sources

PFS	printed factual sources
PHD	personal hard drive / team's *SharePoint*
P&IP	process & innovation performance
P/L	profit and loss statement
RFP	request for proposal
SCM	supply chain management
SD	sample standard deviation
SI	social information
SIS	social intranet sites
SNS	social networking sites
SSS	social sharing sites
TI	task information
TSI	task-solving information
T&OP	talent & organization performance
UET	unstructured exploration task
WBT	web-based training

1 Introduction

Social software applications such as online social networks, wikis, blogs and social sharing sites have changed today's media and information landscape. Already web services like *Facebook*, *YouTube*, *Wikipedia*, *Blogger* and *Twitter* are among the most visited websites with user populations larger than most nation states and have a strong impact on the way people communicate and exchange information. This is primarily the case in regards to leisure-based topics of interest. Especially young adolescents seem to draw to emerging technologies and naturally integrate these types of applications into their everyday life. Therein, social software is increasingly used not only for entertainment but also as a source of information. As such, young adults might post a status message to their personal social network to ask for hints where to find the most interesting websites on a certain topic, visit *Wikipedia* or *TripAdvisor* to learn about a city's history and sites, or follow their most favorite movie star or athlete on *Twitter* to stay up-to-date on their latest thoughts and activities.

Having this generation of young employees enter their organization, today's enterprises are wondering what role social software plays as an information source in the corporate world. While some companies decide to ban it from the workplace, others aim at benefiting from their rising popularity for professional purposes by integrating or copying phenomena of the social web within corporate intranets. However, there is a lack of scientific understanding of the characteristics of these applications and, more importantly, of the behavioural patterns of this user group in the interaction with social software.

As Vakkari et al. (1997) have argued,

> "[…] without understanding human information behavior, meaningful design of information systems and reasonable utilization of information in our society is not possible. One task of information needs and seeking (INS) studies is to create knowledge which supports humans and organizations in their use of information and their design of information systems." (Ibid.: 7)

Hence, this doctoral dissertation aims at modeling the information seeking behavior of young professionals and thus contributing to a better understanding of the role of social software as an information source in the workplace and ways to meaningfully integrate it into the corporate information environment.

In the course of this thesis a specific perspective, context, methodology and scope were chosen in order to satisfy a certain research interest and motivation. This chapter introduces these aspects and sets the scene for the analysis of social software and its role as an information source in the workplace in section 1.1 by presenting the initial considerations, which drive the overall research interest of this doctoral dissertation. Section 1.1 then defines the objectives and scope of this study in the field of information science. Following the characterization of the scientific perspective in section 1.1, the industry of management consulting is described as context of application in section 1.1. Based on these prerequisites, the structure of this thesis is summarized in section 1.5.

1.1 Setting the scene

"*In the generation now entering the workforce we are seeing some very different signs on how they want to work, and the huge influence that technology and modern media are having on their lives* [...]."
(Cheese et al. 2007: 38)
Peter Cheese, Head of Talent & Organization Performance, *Accenture*

"*Before older managers retire, they need to transform the workplace to accommodate the expectations and work patterns of this new workforce.*"
(Schooley 2005: 2)
Claire Schooley, *Forrester Research*

The statements gathered above, provide first insights into one of the most dominant discussions of talent and organization performance professionals across all industries and geographies today. There is a certain expectation (or concern) that a new generation[1] of employees – characterized by a common set of beliefs, attitudes, abilities and technological familiarity – is entering today's workforce and will require drastic changes regarding processes, tools and organization of work. Today's managers wonder what kind of workplace environment needs to be provided for these new employees, who grew up

1 Whether these expectations indeed describe a generational phenomenon or not will be further examined in section 1.1, but shall not be the focus of this study.

naturally interacting with modern web technologies (e-mail, WWW, chat, or mobile web) and are largely familiar with emerging web applications.[2] Social sharing, networking, blogging and online collaboration via wikis describe the advent of a *participative web* (Wunsch-Vincent/Vickery 2007) which has changed the way information is created, disseminated and retrieved in the public domain. Together with the observation that these web phenomena are specifically popular amongst and quickly adopted by the young, today's corporate organizations are wondering whether and, subsequently, how, to include them in the information environment at the workplace.

On the one hand, there are enthusiasts who advocate for their inclusion in the workplace and even envision the 'Facebookisation'[3] of the enterprise. They claim that these social web services not only offer valuable information for professional use, but also promise a paradigmatic change of organization of work and enterprise collaboration. As a basic principle they assume that opening the corporate information environment towards the social web transforms the workplace to accommodate the expectations and work patterns of the new workforce generation discussed earlier.

Conversely, critics question the utility of such sites for work purposes and plead to ban the social web from the workplace. Instead, some propose to transfer its popular bottom-up concepts of user generated content and online collaboration into the safe and controlled boundaries of corporate organizations. As a result, many enterprises have introduced a wide range of internal social software applications under the name of *enterprise 2.0* in hopes of offering young professionals a natural environment for corporate knowledge management, e-learning, customer relationship management and much more. They often come to realize, however, that the popularity and the high usage of the social web cannot necessarily be translated into a social intranet.

While it is impossible to decide which position is entirely right or wrong, the overall tenor of these considerations is that of a changing information environment, the perceived uniqueness of working and information seeking behavior of young adults and the question of how to include these phenome-

2 For example, in the study "Spatially Bounded Online Social networks and Social Capital" 94% of the undergraduate students were *Facebook* members (cf. Ellison/Steinfield et al. 2006: 19).

3 A term coined by Rangaswami (2010) in a blog entry on a vision of the future workplace.

na in the context of a corporate workplace. These rather broad deliberations set the scene for this doctoral dissertation in the field of information science.

1.2 Scope and objectives

It is the objective of this study to add a scientific voice to the previously described discussion by analyzing the role of social software[4] in the workplace environment of so-called 'young professionals'[5] in a specific light. The perspective of information science lies in the potential of these applications to serve as sources of information in a professional work context. In order to come to an understanding of whether and, if so, how social web as well as internal social software applications may meaningfully be included in the electronic information environment of corporate organizations, the work context and the workplace behavior of this share of the workforce need to be thoroughly understood. Therefore, the task-based information seeking behavior of young professionals and its contextual influence factors in a specific domain are examined. Furthermore, the character of social software, the information provided by such applications and the way a new group of employees makes use of these tools for private and professional purposes is analyzed. The collective understanding of this user group, their work context and the character of such tools enables the derivation of recommendations regarding the design of the electronic information environment in the workplace of young professionals. In summary the objectives of this thesis may be described as follows:

4 In the following it will be differentiated between *social* '*software*' and '*web*'. This study will consistently refer to the former, when describing applications of this category in general and to the latter, only when relating to web-based applications that are publicly available on the World Wide Web. These terms will further be defined in section 2.1.1.

5 This term will be further defined in section 1.1.

Table 1: Overview of main objectives of doctoral dissertation

1.	Gain a deep understanding of the phases of task-based information seeking and their influence factors at the workplace of young professionals.
2.	Analyze the use of information sources and their characteristics in the electronic information environment of young professionals.
3.	Identify the role of social software applications for the common task-based information seeking behavior of young professionals.
4.	Derive conclusions regarding the design of the information environment of young professionals in order to include social software applications as sources of information in the workplace.

For this matter, the scope of this thesis is the individual's workplace behavior in order to overcome situations of uncertainty by undertaking a process of information seeking. In other words, to use information sources and tools in order to develop the necessary knowledge, skills and attitude so that a specific job role may be performed and a work task at hand is solved successfully. Such a perspective implies that there is not a specific knowledge to be taught (neither in a formal nor informal learning environment), but moreover an undefined set of information, experience and values, which is to be acquired in a specific context. Furthermore, the focus of this study lies upon the individual and not the organizational performance or collaborative processes in the workplace. Of course, 'social' software implies the collaboration and interaction with others. However, it is the individual who makes use of the various sources provided by these applications. It is the goal of this thesis to understand the information seeking behavior of young professionals and thus the role of social software as a mean to support an individual's task performance in a knowledge-intensive work environment. Other perspectives such as e-learning or knowledge management concepts, which focus on the distribution of information within an organization or group of employees, would therefore not be adequate.

1.3 The perspective of information science

Contributing to the field of information science, this thesis takes a specific position on the scene set in section 1.1 as well as the previously described

scope and objectives of this study. Accordingly, it draws upon a certain set of methods and needs to be aligned with existing research models and findings of its scientific discipline. The resulting perspective can best be described when taking a closer look at its overarching research domain. Information science was originally considered as

> "[…] that discipline that investigates the properties and behavior of information, the forces governing the flow of information, and the means of processing information for optimum accessibility and usability. It is concerned with that body of knowledge relating to the origination, organization, storage, retrieval, interpretation, transmission, transformation, and utilization of information." (Borko 1968: 3)

As such, information science is rooted in the documentary-librarian tradition on the one hand and the computer-oriented, logical-mathematical one the other hand. While the latter is primarily concerned with formal systems, algorithms, standards and their performance, the former deals with information objects and takes into account their entire life cycle (cf. Womser-Hacker 2010: 335). As a result, information science approaches human behavior and system interaction from a cognitive perspective and

> "[…] is concerned with how the human transforms messages about events into information and how that information is acquired, stored, retrieved, and processed. As a process, information science attempts to understand how signals and data are acquired, stored, retrieved, and transformed into information that directs the behavior of humans in everything from simple physical reactions to complex problem solving. [...] Information science attempts to understand how to extend human information processing abilities such as decision making, problem solving, and learning." (Williams 1997: 3 ff.)

Within the areas of investigation mentioned earlier, one key notion of information science may be identified: the understanding of information and knowledge. Therein, information is defined as knowledge relevant to action within a specific context of problem-solving. The so-called 'pragmatic postulate' refers to the transformation of knowledge to information, in which informational surplus is created by refining information from a stock of models about objects and circumstances of the world, which is existent in an individual or group, depending on the recipient and his context (cf. Kuhlen et al. 2004: 62). The concept of information in information science accordingly is directly depending upon the user and her/his respective context, while, for example, the concept of information in computer science is abstract (cf. Rauch 1988: 26). Analyzing this process of refinement (in terms of contextual adaptation), a variety of research fields within information science has

evolved. Some examples of the following categories developed by Borko (1968) reveal the heterogeneity of information science:

- information needs and uses,
- abstracting – classification – coding – indexing,
- system design,
- analysis and evaluation,
- adaptive systems

(cf. ibid.: 4).

Altogether, there is a wide range of sub-disciplines within information science ranging from information systems, information retrieval (IR) and human-computer interaction (HCI) to information/knowledge management and knowledge representation. This thesis stands in the tradition of these fields of investigation and the methods developed therein. More specifically, it can be assigned to the cognitive perspective on *information seeking behavior*[6] (ISB), which – as seen from the traditional perspective of information retrieval – widens the scope of interest by analyzing the user in context and including all information-related activities individuals undertake in certain settings. Research in this field thus analyzes the "[…] human behavior dealing with generation, communication, use and other activities concerned with information, such as, information seeking behavior and interactive IR" (Ingwersen/Järvelin 2005: 21). This scientific perspective is fundamental to information science and may be considered as part of the research field of *information needs, seeking and use* (INSU) mentioned earlier. The developed conceptual models, processes, activities and emotional states describe the context of information seeking behavior and knowledge work. This refers to a form of "[…] human information behavior dealing with searching or seeking information by means of information sources and (interactive) information retrieval systems" (Ibid.: 386).

Since information science is of an interdisciplinary nature, the methodical approach of this study includes a combination of qualitative and quantitative methods, which partially have their seeds in other scientific disciplines. The perspective of information science, however, focuses on the individual users within an informational environment and their information behavior. According to the definition of this scientific discipline and its central elements, so-

6 Chapter 3 provides further details regarding this field of research, its central concepts, and relevant previous findings.

cial software – as a phenomenon of the *web 2.0* – will be analyzed with a focus on content, i.e. the information provided by these types of applications. Furthermore, the individual behavior of young professionals in the search of and interaction with information in their job-related activities will be considered through this described perspective. Thus, the gathered analytical understanding of task-based information seeking behavior, its contextual influence factors and the characteristics of the information provided by social software contributes not only to existing research in the field of information science but also allows deriving recommendations from a management perspective on whether and if so, how to include this type of media meaningfully in corporate electronic information environments.

1.4 The context of management consulting

Since the specific context of information and the respective actors are essential to a scientific perspective, it is important to understand the professional environment in focus of this doctoral dissertation. Any evidence for or against the utility of social software as a source of information and the way it ought to be meaningfully included in the workplace environment, will depend upon the characteristics of the specific industry and domain it is evaluated for. As a basic principle, this applies to all elements of research in the field of information science. When evaluating the usability of human-computer interfaces, the quality of information retrieval systems, or the information needs and uses of a certain user population, the context of use is mostly considered to be a central influence factor on the validity and limitations of research findings. Therefore, in order to analyze the above mentioned considerations, a specific context needs to be defined for this study.

Even though the considerations described in section 1.1 may apply to a wide range of corporations and industries, some domains appear to be affected more than others by the rising popularity of social software and the involved changes of the electronic information environment. This particularly applies to the sector of so-called ‘knowledge-intensive business services’ (KIBS), which “[…] are mainly concerned with providing knowledge-intensive inputs to the business processes of other organisations, including private and public sector clients” (Muller/Doloreux 2007: 5). In general it is

said that they "[…] involved economic activities which are intended to result in the creation, accumulation or dissemination of knowledge" (Miles et al. 1995: 18). Thus, enterprises providing these services are characterized by a highly educated workforce with a large degree of computer-supported intellectual activities in the service sector and stand in contrast to rather physical craftwork such as in the manufacturing industry. These characteristics reveal the relevance of KIBS for the scope and objectives of this study. Previous research on models of information seeking behavior and the use of specific sources of information has considered quite a wide range of workplace contexts, such as those of engineers (Cool/Xie 2000; Du Preez 2008; Ellis/Haugan 1997; Fidel/Green 2004; Hertzum/Pejtersen 2000), physicians (Gorman 1995; Leckie et al. 1996), lawyers (Kuhlthau/Tama 2001; Leckie et. al 1996; Makri 2008; Wilkinson 2001) or social workers and public-service employees (Byström/Järvelin 1995; Byström 2002/1999), which may all share the above described characteristics to a certain degree. However, especially industries with a comparably young workforce are facing the question of how to adapt their workplaces to a new generation of employees that show a high familiarity with this type of web-based applications.

This second characteristic makes the context of management consulting particularly relevant for the purpose of this thesis. As an essential element of knowledge-intensive business services, management consulting may best be described as

> "[…] an independent professional advisory service assisting managers and organizations in achieving organizational purposes and objectives by solving management and business problems, identifying and seizing new opportunities, enhancing learning and implementing changes." (Kubr 1996: 8)

The portfolio of consulting services includes the development of strategies and measures regarding the cutting of operational costs, new market entries and portfolio diversification, the restructuring of organizations and the introduction of new processes or information systems into organizations, to mention but a few. Figure 1 presents an overview of all fields of activity within the German consulting market and its allocation according to volume of sales in 2008.

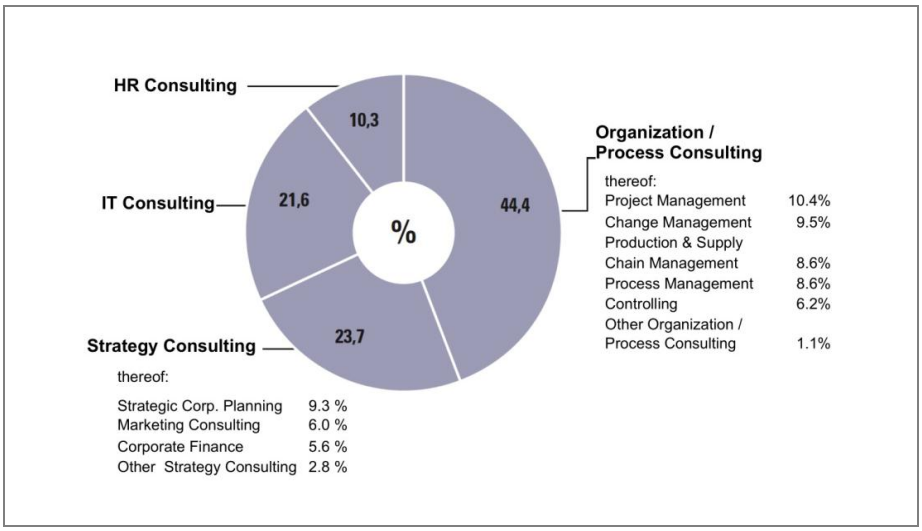


Figure 1
Allocation of German consulting market in 2008 (adapted from BDU 2009: 8)

In the development of strategies and measures, as well as in the support of their implementation, in the mentioned management fields the main value propositions consulting firms offer their clients are: methodical skills, functional (or industry) expertise, flexibility and, of course, the external and independent perspective on the clients' organizations. In order to benefit from these propositions, companies turn to management consultants for the delivery of short- to mid-term projects. Depending on the size of the client and the project scope, the consultancy assembles a team of professionals based on functional and personal requirements. The typical phases of the consulting process may be described as 'entry', 'diagnosis', 'action planning', 'implementation' and 'termination' (see figure 2). The length of each of these phases depends on various aspects of the client's intention and situation, such as complexity, size and urgency. As a basic principle, however, these engagements are temporary and share the traditional characteristics of a project[7]. This suggests that management consultants pass through many different organizations in their professional career. Either focused on a functional field or an industry, they develop a large extent of their competencies on the job.

7 This refers to an undertaking, which is characterized by its uniqueness of conditions in terms of its set targets, and temporal, financial, and resource-related restrictions. It accordingly may be delineated by other activities, which are part of daily corporate operations, and is established in a project-specific organization (cf. DIN standard 69901).

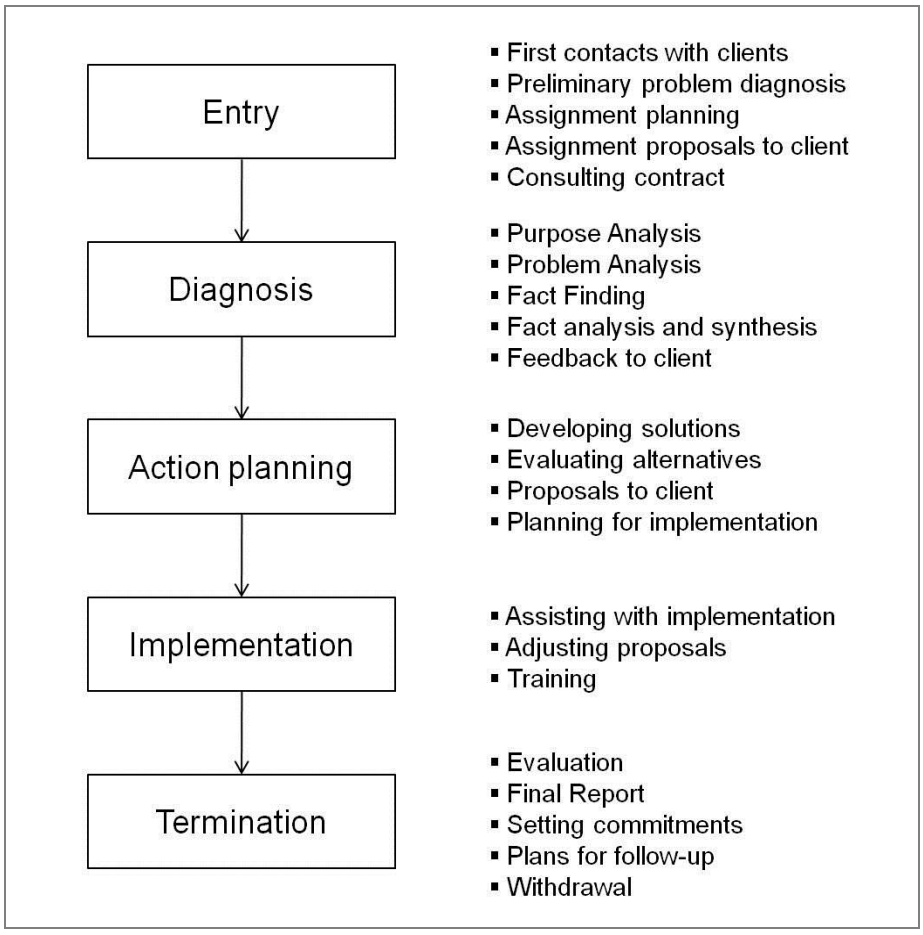


Figure 2 Phases of the consulting process (adapted from Kubr 1996: 22)

Based on a certain set of methodical and analytical skills, they learn how to use experience from previous assignments in order to help their next client to face new situations. Furthermore, "[…] professionals employed by consulting firms can learn from the experience of their colleagues who have worked for other clients, and use the whole firm's accumulated know-how" (Ibid.: 4f.). The management consulting industry is consequently often times referred to as 'people business' with 'talent powered organizations'[8], since

8 A term introduced by Cheese et al. (2008).

their almost exclusive asset is the human talent of their workforce and the experience and know-how gained and maintained over their years of service.

In order to understand why the context of this study was chosen for the analysis of the role of social software for task-based information seeking behavior of young professionals, it is essential to take a closer look at the roles and tasks individuals perform in this industry. In general, the profession of management consulting can best be described as follows:

> "An individual becomes a management consultant by accumulating, through study and practical experience, considerable knowledge of varying management situations and by acquiring skills needed for solving problems, improving organizational performance and sharing experience with others: understanding the nature and goals of organizations; finding information; analyzing and synthesizing; developing proposals for improvement; communicating with people; planning changes; coping with resistance to change; motivating people; helping clients to innovate and learn from experience; and so on." (Kubr 1996: 4)

While this role description may in some parts apply to a variety of today's job profiles in the knowledge-intensive service industry, it is the dynamic project environment of changing clients and their industries that acts as a catalyst for the described activities. As an external supplier of more complete and relevant information, a management consultant enables his client to make the right decisions. Kubr summarizes the importance of information seeking skills in consulting with the following description:

> "It can be information on markets, customers, sector trends, raw materials, suppliers, competitors, potential partners, sources of engineering expertise, government policies and regulations, or other. The consulting firm may have this information in its files, or know where and how to find it. Information gathering and analysis may be the only or the main objective of an assignment. Finally, any consulting assignment will have an information dimension and function. There is no consulting without working with information and providing better information." (Ibid.: 14)

The character of this work context brings about challenges of two dimensions. On the one hand, individual requirements for the role of young job-entrants in management consulting may be defined. Along with key skills such as logical reasoning, strategic thinking, people and communication, as well as certain functional skills, information literacy[9] is a fundamental re-

9 "To be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information." (ALA 1989: 1)

quirement for young professionals in management consulting. Cheuk (2002) also highlighted the importance of this demand in her study on information literacy in the workplace context:

> "It is important to be information literate in the work settings because the workplace of the present and future demands a new kind of worker, who have [sic!] to access, manage and use the vast amount of information delivered to them through multiple channels (e.g., phone, Internet, e-mail, printed documents, Web-casts) and in a wide variety of formats (e.g., video, printed, electronic text)." (Ibid.: 2)

The description of requirements in today's workplace as such or in specific (as in management consulting) may clearly be directed at the employees and their preparation for the job environment. As a result, many studies concerned with this phenomenon (e.g., Klatt/Gavriilidis et al. 2001; Bruce 2002; Virkus 2003; Kirton/Barham 2005) mainly considered the educational aspect of it. The adequate preparation and development of young job entrants for such a workplace environment, of course, is an essential prerequisite for any of the further developed considerations of this study. There is, however, a second dimension to it – the organizational challenge. One of the main concerns of consulting firms is related to the management of information in order to provide their employees with an organizational and technical infrastructure, which enables them to meet the demands of their work roles in the context described above. Consequently, swift access to comprehensive information and the ability to exchange information electronically are not only necessary prerequisites an organization has to provide for their employees, but also have become key differentiators in the consulting industry (cf. Kubr 1996: 648).

The strong focus of this environment on the acquisition of knowledge, the transfer of information and the creation of information-based analytical services makes it particularly relevant for information science. On the one hand, this industry serves as fruitful object of investigation for the research interests of information science. On the other hand, findings from such disciplines as information retrieval, human-computer interaction and information needs and uses are highly applicable for knowledge-intensive business services in general and management consulting in particular.

Furthermore, the management consulting industry consists primarily of a large share of young professionals. This brings together both central elements of the research interest of this thesis. As a result, the hypotheses and conclu-

sions from this doctoral dissertation will not be limited to but will stem from specific observations within this industry[10].

1.5 Structure of this thesis

In order to satisfy the overall research interest and achieve the objectives described above, this thesis initially presents its central determinants and investigation objects in chapter 2. Thus, the first section describes the rise of social software, classifies the respective types of applications and reviews areas of related research. Furthermore, the alleged natural interaction of the '*net generation*' with such emerging technologies is discussed and the sample group of young professionals is characterized. This leads to the consideration of social software usage in the workplace and the role of user-generated content as a source of information. Chapter 3 characterizes the field of *information needs, seeking and use* studies and defines central concepts and previous findings of information seeking research. The state-of-the-art in this scholarly field is presented in order to review the most relevant models and findings for the research interest of this doctoral dissertation. As a result, the research problem is further substantiated and respective research questions are posed in chapter 4. In addition, the methodical approach of this study is outlined, providing the theoretical foundation for the subsequent empirical part. Chapter 5 initiates the empirical part of this study. It develops a conceptual understanding of the information seeking behavior of young professionals in management consulting based on an analytical literature review and a qualitative field study. Moreover, the explorative analysis of the information environment, information sources and information types in the field of investigation is documented. Based on the conceptual model of task-based information seeking behavior of young professionals and the analyzed nature of information sources, the working hypotheses are then refined. This builds the foundation for an extensive quantitative study, which is presented in chapter 6. Therein the results of a context-specific online survey are revealed, describing the usage of information sources of young professionals in

10 See chapter 4 for a closer description of the study setting and chapter 8 for a final discussion of relevance and limitations of findings.

management consulting. All of these results are consolidated in chapter 7 and discussed from a leadership perspective. Together with the theoretical considerations of chapter 2 and 3, the descriptive findings of the qualitative as well as quantitative study are assessed in the light of context-specific challenges and leadership interests. The critical analysis of the actual task-based information seeking and source usage behavior of young professionals leads to a set of measures for leveraging the potential of social software as an information source in the workplace. Finally, chapter 8 summarizes the conclusions of this thesis, their contribution to the field of information science and discusses their limitations. This final chapter also points out further research needs, which result from the considerations and findings of this study.

2 Social software in the workplace of young professionals

Further elaborating on the point of departure of this thesis, the following chapter presents central definitions as well as an overview of existing research regarding its two main objects of investigation. In order to better understand the scope and objectives of this study as defined in section 1.1, the concept of social software and its specific relevance for the group of young professionals as well as the workplace environment are further explained. Therefore, section 2.1 characterizes social software, presents a typology of applications and provides an overview of areas of related research. Section 1.1 reflects upon the notion of a 'net generation', presents the results of existing studies on social web usage of young adolescents and common assumptions about this group of young members of society. A short overview of the discussion of the generational concept then provides an understanding of the terminology and characteristics of the sample group selected for this study. This leads to the consideration of the role of social software in the workplace, presented in section 1.1. Apart from the statistics regarding the use of social media at work, first approaches of transferring the social web into the corporate boundaries of a 'social intranet' are discussed. Finally, the perspective on user-generated content as a source of information in the workplace environment is further explained. Section 1.1 summarizes these considerations and main observations from the review of existing literature and practices, which gave rise to and further define the research interest of this study.

2.1 The rise of social software

Within the past ten years a whole new set of web applications has evolved and changed the way information is distributed throughout the World Wide Web significantly. Sites such as *Wikipedia*, *Flickr*, *del.icio.us*, *Facebook*, *MySpace*, *Xing*, *YouTube*, *LinkedIn* and *Twitter* appeared and quickly reached the top of the rankings of sites with the most page views around the

globe.[11] These applications are not necessarily characterized by innovative technologies, but more importantly by a common principle. They broke the prevalent paradigm of the Internet as *web of computers*, which connected machines to an informative web generated by mostly professional information suppliers and shifted it towards a *participative web* (cf. Wunsch-Vincent/Vickery 2007) by setting the focus on using the web as a social platform with the aim of enabling users to interact, share and collaborate with each other. As a result, a central characteristic of social software is that the lines between consuming information and its production are blurred. The active user of weblogs, social networks, social sharing services and wikis is at the same time recipient of data, information and content and producer of the same (cf. Schmidt 2008: 42). This notion of 'produsage' (cf. Bruns 2007; Toffler 1980) is a key element in shaping the social side of such software applications.

2.1.1 Definition of social software

Tim O'Reilly was the first to summarize this new type of web applications as 'web 2.0' (2005) from a rather practical perspective and expressed with this term the novelty and progress in contrast to the previous understanding of the Internet – accordingly the 'web 1.0'. Describing this phenomenon in detail he defined seven principles:

- The Web As Platform
- Harnessing Collective Intelligence
- Data is the Next Intel Inside (importance of data ownership)
- End of the Software Release Cycle
- Lightweight Programming Models
- Software Above the Level of a Single Device
- Rich User Experiences

All of these axioms aim at expressing the growing importance of people and their inclusion in the continuous development of software and generation of data, while editorial content and traditional market controls become seemingly irrelevant. These claims have increased in popularity – regardless of the

11 According to *Alexa Facebook* (2), *YouTube* (Rank 3), *Baidu* (6), *Wikipedia* (7), *Blogger* (8), and *Twitter* (10) were ranked within the most visited sites globally (cf. Alexa Internet Inc. 2010).

lack of scientific validation – and many applications and concepts connected to any one of these have picked up the terminology by using the addition 2.0. This is a clear indication of the shift towards a new generation of web tools. Reviewing these principles it is evident that technology is only a small part of this conception. New technologies such as AJAX, RSS, Microformats, OpenAPI, wikis and others can indeed be considered as one of the drivers of the popularity of web 2.0. Wunsch-Vincent and Vickery (2007), however, name economic, legal and institutional and social developments as further drivers. Within this OECD study the web is described as 'participative' and its content as 'user-generated'. Taking this perspective into consideration, the importance of the users and their activities in collaborating, connecting and exchanging information with each other emerges as a central element of the web 2.0.

This brings us to the term social software, which can be considered part of the overall realm of web 2.0, although this descriptive name for the new class of applications has been in existence since the '*Social Software Summit*' in New York in 2002 (cf. Hippner 2006: 7). While the first attempts to specify this term had only mentioned the aspect of interpersonal connectivity (which can be considered a characteristic of many IT applications), more recent scientific opinions in the field of information science have identified four central functions of social software applications. These can be summarized as

- communicative function
- relationship function
- collaboration function and
- information function

(cf. Ebersbach et al. 2008: 29; cf. Hippner 2006: 8).

Serving as platforms for users to interact with each other, the most elementary function of social software applications is to enable communication between individuals. This function builds the foundation for all of the others by establishing a channel for interaction between the actors involved. Communication therein typically is not bi-directional (one-to-one communication), but rather multidirectional. Moreover, it can be distinguished from the traditional one-to-many communication, which was characteristic for the web 1.0-paradigm. Social software instead creates a type of computer-mediated public, in which many-to-many communication takes place between members of personal networks as well as complete strangers. In many ways this type of communication can even be called 'undirected', since no specific

addressee other than the public can be identified. Most importantly, almost all types of activities in social software applications can be considered a communicative act. This highly interactive type of software or web service offers many ways to communicate via short messages, comments, status messages, articles, pictures, videos or profile information.

This last form of communication highlights another central function of social software applications: building relationships. As described above, the focus of the web 2.0 is to connect people instead of computers. This paradigm shift can be observed in a number of explicit instances. Since users are motivated to participate and communicate on the platforms offered to them to a large degree, social software is used to build, nurture and most importantly visualize social networks. By disclosing personal information and building a virtual social profile, the communication between people is enriched with background information required to discover similarities (be it for example in interest or origin) and thus weave a network of personal acquaintances for further interaction.

Once such a connection of individuals and their communicative interaction is in place, the collaborative function of social software emerges. Many of the social software applications aim at bringing together people with common interests or goals in order to support their collaborative efforts. In order to unleash this so-called 'wisdom of the crowds' these applications lay the groundwork to allow diversity of opinion, independence and decentralization of the individuals involved and aggregation of contributions in order to turn private judgments into a collective decision (cf. Surowiecki 2007: 10). Of course, this describes an ideal that needs to be questioned critically. Collaborative efforts in virtual communities, even in initially flat and open hierarchies, develop certain structures and phenomena, which confront the users of social software with challenges of inequality or exclusion. Thus, the diversity and quality of such collaborative tools need to be considered with caution. Once again, however, this function of social software applications is not so much the result of technological innovation but rather a mixture of societal developments and low-threshold applications.

Finally, social software applications fulfil an informative function. In all of the use cases described above, the flow of information between individuals as well as machines is the implicit driver of the respective function. While providing information may not be considered an aspect specific for social software, the exchange of information is at the heart of these applications. People are enabled to share information about their state-of-mind, previous

experience and expertise, or simply their current location. Social software applications share the dominant characteristic of being highly dynamic and information-intensive services. The information provided by these – or more precisely by their users – constitutes the social or collective context of the individual contributors and users of social software applications. Taking these functions and considerations into account, leads to the following definition:

> *Social software (or web) consists of web based applications, which support users in exchanging information, building and nurturing relationships, communicating and collaborating in a social or collective context, as well as the resulting data, and the relationships between people using these applications* (cf. Ebersbach et al. 2008: 29 ff.; cf. Hippner 2006: 8).

This definition shall serve as a working basis for the research interest of this thesis. While there are many different understandings circulating about what characterizes this type of software applications best, this definition summarizes the above mentioned developments best and represents the perspective of information science. In addition to the above mentioned functions of social software it introduces with the inclusion of 'the resulting data' another important aspect that will be elaborated further in section 2.3.3.

2.1.2 A typology of social software applications

In order to gather a better understanding of the types of applications covered by the developed definition of social software, a classification of applications is needed. Ebersbach et al. (2008) defined four central types of social software applications and positioned them in a scheme together with the functions introduced above. These categories are:

- blogs, microblogs and status messages,
- social networking,
- social sharing and
- wikis.

Figure 3 displays these types of social software in a functional scheme. The circle as element surrounding and including the various types of software represents the communicative function, which all of the tools share to the same degree.

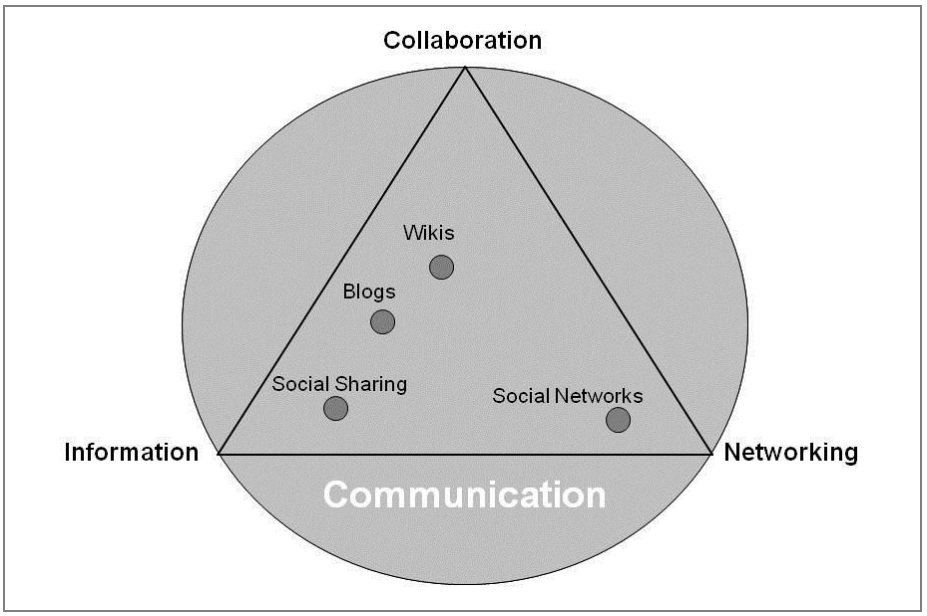


Figure 3 Social software scheme (adapted from Ebersbach et al. 2008: 35)

These four types of applications, however, do not only serve a communicative function. As pointed out, communication enables the exchange of information, the collaboration and the building and nurturing of relationships. Within the triangle of these three additional functions, the four types of social software can be placed according to their main use and relative distance to the respective functions.

Blogs, microblogs and status messages

The term 'blog' or 'weblog', which first appeared at the end of the 1990s, describes a type of webpage that provides easy-to-use functionalities for publishing short messages or articles in reversed chronological order on a personalized website. They represent the further development of personal homepages, which still required skills in programming HTML code and using FTP servers. According to Gill (2004) primary characteristics of a blog include:

- reverse chronological journaling (format)
- regular, date-stamped entries (timeliness)
- links to related news articles or documents (connectivity)
- entries within each entry (attribution)
- archived entries (old content remains accessible)

- links to related blogs (blogrolling)
- RSS or XML feed (ease of syndication)
- passion (voice)

(cf. ibid.: 2).

Primarily, the main characteristic of blogs is their low threshold of publishing articles to a wide audience for users of all backgrounds. With the rise of blog hosting services (e.g., *Blogger*), the technical burden of maintaining a hosting account and a software application has been removed (cf. Wunsch-Vincent/Vickery 2007: 36). The interfaces of these services as well as desktop-based blogging software are easy-to-use and provide the ground for what is also called *amateur journalism*. Therein, publishing, as well as consuming blog content does not require users to visit the people's websites explicitly. Since blogs are described in a simple formatting language and allow the distribution of new content via RSS feeds, most of the information provided by blogs is not perceived in the immanent environment of its original publication. The same can be said about comments and replies to these posts, since a variety of browser- or desktop-based feed-readers allows the aggregation of and interaction with blog content and bloggers. In borrowing the terminology 'log' from the nautical context reveals, a weblog is updated very frequently. These updates are called 'posts' and may consist of longer text entries, short remarks, as well as pictures, links or even videos. The type of information contained within a blog varies greatly depending on the personal interest and intention of the 'blogger'. It can describe day-to-day observations from a personal as well as professional context. Some frequently visited blogs are topic related. Some offer a mixture of personal events in the author's life (cf. Brady 2005: 4). Nardi et al. (2004) analyzed the bloggers motivation in an ethnographic study and identified a variety of motivations, i.a., including writing a blog

- to 'document life',
- as commentary,
- as emotional and intellectual catharsis and
- as community forum

(cf. ibid.: 43 ff.).

This way a blog represents a hybrid of a communication and an information tool. The aspect of collaboration comes into play when considering the entirety of weblogs. O'Reilly (2005) describes this phenomenon of heavily interlinked and reciprocally referring websites as follows:

> "The 'blogosphere' can be thought of as a new, peer-to-peer equivalent to Usenet and bulletin-boards, the conversational watering holes of the early Internet. Not only can people subscribe to each others' sites, and easily link to individual comments on a page, but also, via a mechanism known as trackbacks, they can see when anyone else links to their pages, and can respond, either with reciprocal links, or by adding comments." (Ibid.: 7)

Thus, blogs can be understood as a form of interpersonal communication that allows users to stay up-to-date about events and opinions within this type of community (cf. Ebersbach et al. 2008: 66). In many ways, however, they are more than that and in some ways represent a new form of journalism or even scientific communication.

The types of blog articles described above require a certain amount of effort and skill. Based on the widespread use of short messaging services (SMS), a new sort of communication and information tools has emerged: so-called '*microblogs*'. As the term itself implies, microblogging services resemble a more compact form of blog entries. With the rise of the web service *Twitter*, which was launched in 2006, the "SMS of the Internet" (D'Monte 2009) gained worldwide popularity. *Twitter* gave rise to a group of microblogging services which enable users to send and read other users' micromessages (also known as *tweets*) which are text-based posts of up to 140 characters. The tweets are displayed on the user's profile page and delivered to other users who have subscribed to them (known as *followers*). By being available via RSS feeds for desktop readers, integrating with mobile phone service providers and adding geo-location information, these social web services are characterized by seamless and ubiquitous accessibility. Thus, they have developed their own characteristics and differ from the traditional motivation and use of blogs. The main motivation for users to publish a micromessage is to share what they are currently doing or thinking[12] with the public or a group of interested followers. While *Twitter* is the most popular microblogging platform and does not target a certain group of users or defines a certain theme for its service, other sites such as *Yammer* (for corporate use) or *Identi.ca* can be considered special interest or geographically limited services. In addition to its communicative function, this group of social web applications is of growing informational value (as will be discussed in section 2.3.3) and furthermore supports social networking of its users. By sha-

12 The original slogan at the launch of *Twitter* was "What are you doing?". Other services also used this phrase or adapted it slightly, e.g., *Facebook* "What's on your mind?" or *Yammer* in the corporate context with "What are you working on?".

ring their current location, activities and state of mind, users create a virtual co-presence with their followers and thus nurture existing relationships and establish new ties. In this sense, microblogging is strongly linked to the concept of status messages, which is an essential element of social networking services. Status messages are just like tweets an instant text-based service in order to share personal information, events and interests with other users. They are, in contrast to microblogging, not limited in character size, but tend to be similarly compact. Another difference between tweets and status messages is the distribution and accessibility of this content. Status messages are not as widely dispersed and primarily directed at the personal contacts of the author as they are embedded in social networking services.

Social networks

'*Online social networks*' (OSN) or '*social networking* services' (SNS) are at the heart of the concept of social software and the web 2.0. They are web-based communities aimed at connecting individuals with friends, colleagues and any other person with a shared private or professional interest. While these platforms have implemented a variety of technical features, their primary element is that of visible profiles that display an articulated list of friends[13] who are also users of the system. Such a profile usually includes a picture, biographical information, as well as further information regarding (job) experience, personal or professional interests and the mentioned articulated list of friends. This visualization of personal information and connections promotes the identification of shared friends, common interests, or subject matter experts (cf. Boyd/Ellison 2007). Accordingly, a central functionality of a social networking service is the previously described status messaging and the act of establishing new connections by adding a new friend to the personal network. The latter is supported by system-generated suggestions based on the provided profile information (concept of shared interest) or the existing list of friends (concept of shared contacts). Based on the motivation of participating users as well as a defined purpose of a SNS, three different types of social networks may be distinguished:

- general interest networks,
- passion-centric networks and
- business networks.

13 Even though most social networking services call contacts of individuals 'friends', the type of connection may be of a different nature than the colloquial term and therefore include further types such as colleague, fan, or acquaintance.

While these networks share the basic idea of relationship-building and offer a similar spectrum of functionalities, they differ significantly by user group and content of interaction. The most popular social networking services are best described as general interest networks. These types of networks have no special focus regarding certain user groups or topics of interest. Instead, they are characterized by the idea of connecting online with friends and friends-of-friends in order to build and nurture virtual relationships. One of the first general interest networks accordingly was called *Friendster* and claimed to focus "[…] on helping people stay in touch with friends and discover new people and things that are important to them" (Friendster 2010). After first SNS like *Sixdegrees* and *Friendster* had prepared the ground for social networks while at the same time had to struggle with technical and social difficulties (cf. Boyd/Ellison 2007), a variety of general interest networks emerged at the turn of the millennium. Primarily the two SNS *Facebook* and *Myspace* have risen to become some of the most popular websites in the world today[14]. Even though *Facebook* may be associated with the higher education domain (as it was originally developed to serve as a virtual yearbook for Harvard students) and *Myspace* is primarily used by upcoming music bands to promote their songs, these social networks cover every aspect of social interaction and personal interests. As platforms like *Sixdegrees* (in reference to the six degrees of separation developed by Milgram (1967) in his 'small world experiment') or the German *wer-kennt-wen* ('Who knows whom?') explicitly pick out as a central theme, the main idea of these social networking services is to weave a human web of contacts based on personal acquaintance. This basic idea gained unexpected popularity and was further implemented by a variety of geographically dispersed services, such as *Qzone* (China), *Cyworld* (South Korea) and *Orkut* (India, Latin America). Apart from enabling and visualizing the connections in between its users, these platforms have grown to become multi-faceted communication, collaboration and information services. The variety of functionalities and the social impact these general interest networks have developed has led to the assump-

14 *Facebook* claims to have over 500 million active users (Facebook 2011), while *Myspace* is reported to have about 125 million users (Crunchbase 2011). Furthermore the Chinese network Qzone is said to have over 190 million active users (Mashable 2011). While these figures are mostly based on self-reported sources and difficult to compare, the sheer size of these networks indicates the popularity of SNS and their place in today's society.

tion that online social networks such as *Facebook* "[…] may become the default operating system of the human web" (Webster 2010).

Passion-centric networks share the same basic functionalities as the previously mentioned SNS but usually have a smaller reach and fewer and more specialized features. Regarding their purpose of use, they are strictly addressing a certain topic of interest or user group. Social networks like *Dogster* help strangers connect based on shared interests. *Care2* helps activists meet, *Couchsurfing* connects travelers to people who offer free overnight stays and *MyChurch* joins Christian churches and their members (cf. Boyd/Ellison 2007). These online social networks are most closely related to the first idea of web communities. They aim at providing a platform for discussion, meeting experts and exchanging experiences from shared private or even professional activities. *Last.fm* is another example of passion-centric networks. It is a social network for music lovers and artists. In addition to enabling relationship-building, if offers a variety of machine-based features helping users to discover other users with similar taste, new interesting artists based on other people's listening behavior and streaming of customized online radio stations. In addition, users may exchange information regarding upcoming concerts and events as well as participate in discussion boards. Dating networks are a very special sub-group of passion-centric networks. They bring together users with a shared interest in the sense of looking for a partner in life. SNS of this variety were among the very first of their kind (e.g., *Match.com* or *eHarmony*) and also include such features as machine-based comparison of interests as described above. In contrast to the online social networks described earlier, however, dating networks aim at matching two people with shared interests rather than weaving a web of friends and friends-of-friends. The field of passion-centric online social networks reveals the importance of revealing personal information and sharing experiences with other users.

Business networks are less widespread online social networks, but have become a central element of the social software spectrum. These SNS focus on interconnecting professionals with an interest in leveraging their contacts in order to improve their business or enhance their personal career. They provide the tools necessary to reach out and establish business connections for the sake of finding cooperation partners, increasing sales, finding new jobs, or approaching specialized job seekers (cf. Nations 2010). The personal profile in such a business network accordingly is reminiscent of curriculum vitae, containing information about the educational background, job experience and professional interests. Additionally, services such as *LinkedIn* – the

world's most popular online social business network with self-reported 75 million registered members in over 200 countries (cf. LinkedIn 2010) – offer the ability to write recommendations for (former) colleagues and cooperation partners. While *LinkedIn* and other services such as *Xing*, *Ryze*, or *Spoke* are publicly accessible web platforms, *CompanyLoop* represents an internal social business network. By restricting access to only co-workers, such networks allow users to connect with fellow employees and share knowledge specific to their business (cf. Nations 2010). Thus, they involve collaboration rather than operating as a simple networking tool.

While the scheme presented in figure 3 aligns social networks primarily to the relationship function, the described types of SNS highlight the fact that social networking services have become multi-faceted information and communication portals. They enable users to send mails, to chat, to blog, to post status messages, to share videos and to collaborate or interact with 'applications'[15] that people can add to their personal profiles (cf. Wunsch-Vincent/ Vickery 2007: 38). With the rising popularity and ubiquity of SNS, social networking functionalities have been integrated into many of the existing websites. Thus, many corporate websites, consumer portals, fan websites, or travel portals have adapted the idea of connecting their users and promoting interactivity and exchange of ideas and experiences among their users. This leads over to the group of social sharing sites, which is another essential element of social software.

Social sharing

In today's digital workplace and personal computing environment large amounts of information objects are created, retrieved, adapted and stored on a daily basis. The interaction with traditional desktop applications such objects as documents, pictures and audio files were primarily stored locally in folder systems on a user's personal computer or external data carrier. With the rise of the World Wide Web, these files, of course, could easily be transmitted to other computers and users, but the exchange of data was always an intentional and primarily uni-directional act. This limited the way information was exchanged to a certain degree. Extending the functionality of personal information management applications by the option to share one's own photos, movies, web links or presentations with selected users of a joint

15 'Applications' is the term for these types of modules in the world's most famous social network *Facebook*.

web platform, is the general idea behind '*social sharing*' (cf. Ebersbach et al. 2008: 100). Social sharing can be understood as a method for Internet users to organize, store, manage and search information resources online with people in their social network or with other users with shared interests. Social sharing applications are mainly browser-based web platforms that enable the exchange of information objects or references to web documents. These services may also be connected to desktop applications or *widgets*, which automatically synchronize their content with the respective web platform and with its users. Even though this type of information sharing is considered *social* and therefore a collective activity, the main characteristic of these types of social software applications is that the users' motivation often is strictly egoistic. By uploading their content to a social sharing platform, users break the boundaries of their personal computer and may access their data from every other device and location. The social element of sharing comes into play, when these collections are made public or at least shared with a selected audience. The attention of other users is drawn to items with similar or related content, which might be useful for their further personal information management. A social collection arises that represents a certain corpus of information objects relevant to its user group.

> "Collaborative tagging describes the process by which many users add metadata in the form of keywords to shared content." (Golder/Huberman 2006: 198)

A central element of social sharing is '*social tagging*'. In order to be able to successfully retrieve their stored or referenced information objects, users of social sharing platforms use '*tags*'. By assigning keywords to documents, photos, videos, or bookmarks, users organize their information collection for future use. By sharing it with other users they not only categorize information for themselves, but they can also browse the information categorized by others. This enables them to access content which they might not have found by themselves and to discover new ways of classifying it. As a result, the concepts of social sharing and social tagging are considered a new form of user-generated information retrieval.

The most popular social sharing applications differ in respect to the type of content they contain. On the one hand, there are the social bookmarking services such as *delicious*, *Citeulike*, *Connotea*, or *Stumbleupon*. These applications are at the heart of the described notion of classifying references to websites in regards to their relevance to specific tags or topics. Subsequently, there are social sharing platforms that are mainly considered with the exchange of photos. Photo sharing services such as *Flickr*, *Picasa*, or *Snapfish*

enable its users to publish their pictures online, enabling the users to share them with others or access them from any other computer. Social tagging plays an important role here, since it allows the intellectual classification of photo content based on the tags assigned to the respective item by the various users. Another popular category of social sharing is video files. *YouTube* as most prominent example of this type of service today has become one of the most visited websites in the world[16]. Therein, users may upload, share and view videos. In the early days of this service almost the entire content was uploaded by individual amateurs, while today large media corporations are using this digital channel for the distribution of professionally created video content. Still, the idea of enabling every Internet user to publish and distribute their own video content is at the heart of social sharing applications. Many individuals have taken this opportunity to create tutorials, share their experience, or promote their talent on such sites as *YouTube*, *MyVideo*, *Vimeo*, or *ScienceStage*. Finally, there is a variety of social document sharing applications. These services aim at the exchange of text documents or presentations. The social sharing platform *Slideshare* for example allows users to upload slide presentations and was originally meant to be used for companies to share slides among employees more easily. This service, however, has gained a lot of attention in the academic field and even private users with special interests. In addition to uploading and tagging these information objects, social document sharing services such as *MyPlick*, *Scribd*, *Yudu* or *GoogleDocs* also offer users to comment, rate, or even collaboratively create or alter documents. The main characteristics of social sharing services across the wide variety of content types and applications, however, can be summarized as follows:

Social sharing services enable users to

- multi-directionally share and publish information objects with a public or selected audience,
- manage and classify information collections for individual as well as collective use by assigning (social) tags and
- identify relevant information objects based on their use and classification of other users.

16 *Alexa* (2010) reports *YouTube* to be the 3rd most visited website in the world. Furthermore, data from the *comScore Video Metrix* service showed that 135.3 million viewers watched 12.9 billion videos on *YouTube.com* in March 2010 (cf. comScore 2010).

These social software applications may primarily be assigned to the information function of the scheme developed in Figure 3. Within all of the above described types of social sharing services, however, a strong relationship and collaboration component may be identified. This especially applies for document sharing applications, which have a strong collaborative function and are strongly connected with the following type of social software.

Wikis

According to the scheme developed earlier, '*wikis*' can be considered the fourth type of social software applications. They are, however, rather a state of mind than a certain piece of software. The most prominent example of a wiki is the online encyclopedia called *Wikipedia*. This free, web-based, collaborative, multilingual encyclopedia project has grown to be one of the most visited sites on the World Wide Web[17] and has promoted the wiki concept most significantly. The idea behind a wiki is that of non-restrictive, collective production and adaptation of content. A wiki accordingly is a web-based document collaboration platform that allows users to add, remove and otherwise edit content. The keys to changing the content of a page are ever-present 'edit'-and 'save'-buttons, a very simple tagging language as well as a revision history page. "The fundamental idea behind a wiki is that a large number of users read and edit the content, potentially enriching it and correcting mistakes" (Wunsch-Vincent/Vickery: 37). This is meant to allow all members of a community to contribute their expertise to a certain article or project and to guarantee that self-organizing quality reviews occur. In the example of *Wikipedia*, the idea is most comprehensible, since an encyclopedia requires a wide breadth of expertise and a high level of content quality. According to the Wikimedia Foundation, the online encyclopedia founded in 2001 counted over 16 million articles from over 1.2 million contributors[18] in 240 active language editions in August 2010 (cf. Wikimedia 2010). Not only does the sheer size of this project reveal the importance of the wiki concept for today's information environment. Studies have also proven that the quality and especially the topicality of the *Wikipedia* has improved over time and comes close to those encyclopedias created in professional routines with explicit quality review mechanisms (cf. Hammwöhner et al. 2007).

17 As it is ranked 7th among the most visited websites in the *Alexa* statistic (Alexa 2010).

18 Contributors are those *Wikipedians* who edited at least 10 times since they arrived.

Even though the *Wikipedia* is the most popular implementation of the wiki idea, a collaborative encyclopedia is only one example of wikis. Wiki sites may be used in a variety of other cases, as for example in project management, creating a knowledge base, constructing a learning environment, writing a technical documentation, or collecting and classifying images. Examples for these application areas are *PBwiki*, *Wikianswers*, *Wikiversity*, *Twiki*, or *OpenStreetMap*. In these situations not always the breadth of the desired content but also the depth or distribution of knowledge and roles among community members are the trigger for such a wiki implementation. The communities required to contribute to a wiki project do not always have to be public audiences. In many cases wikis may be implemented in private or professional groups that are connected within an intranet or in restricted areas of wiki hosting services. Accordingly, varieties of wiki hosting services (e.g., *Wikispaces*) as well as software packages for custom installations (e.g., *MediaWiki* or *Confluence*) exist today. All the different realizations, however, share the very basic idea of the social wiki concept described above.

Like in no other type of social software, wikis require a collaborative culture of participating individuals. Therein the aspect of building a social network with the other users is less relevant. It is rather important for all contributors to understand that each user brings his experience to the table and invests a lot of work in order to create the collective content. The created content contains a variety of personal experiences and opinions (cf. Ebersbach et al. 2008: 42). In contrast to ordinary knowledge management systems, wikis solve the problem of a linearization of knowledge. In this type of asynchronous, computer-mediated interaction a communication process between the authors and the reader takes place. The developing information space can therefore reveal emerging features and has a social character due to the user interaction with the content. Thus, a social information space arises through collaborative, virtual interaction (cf. Müller 2008: 351), which highlights the focus on the collaboration function of this type of social software.

2.1.3 Areas of related research on social software

The rising phenomenon of the participative web with all the aspects and different types of applications described above has drawn a lot of attention via public perception. Apart from coverage in traditional and new media, social software has been subject to academic research in various disciplines. Table

2 provides a non-exhaustive overview of the different research activities, developed concepts and exemplary authors of research on social software in the different disciplines.

Table 2:
Overview of related research areas on social software (non-exhaustive)

Discipline	Subject	Authors
Education	life-long learning, competence development, connectivism, computer-supported cooperative learning, self-directed learning	i.a.: Siemens (2004, 2006); Tully (2004); Downes (2005); Attwell (2006); Dalsgaard (2006); Owen et al. (2006); Ehlers (2006); Koper/Specht (2006); Erpenbeck/Sauter (2007); Klamma et al. (2007); Seufert/ Brahm (2007); Marenzi et al. (2008); Väljataga/Fiedler (2008);
Economics/ Business Studies	knowledge management, expertise location, crowdsourcing, collaboration, organization management	i.a.: McAfee (2006); Smolnik/Riemp (2006); Grossman/McCarthy (2007); Griesbaum (2007), Grob/Vossen (2007); Summerfield (2007); Reinmann/Eppler (2007); Müllner (2008); Maßun (2009); Böhringer/ Richter (2009); Riemer/Richter (2010); Ehrlich et al. (2010)
Psychology/ Sociology	virtual identity, privacy, sociality, societal and demographic developments, socio-technical phenomena	i.a.: Ellison et al. (2006; 2007); Hargittai (2007); Lenhart/Madden (2007); Strater/ Lipford (2008); Boyd/Ellison (2007); Boyd (2008); Palfrey/Gasser (2008); Weinberger (2008); Rowe (2010)
Library and Information Science	information literacy, folksonomies, tagging, social web usability, collaborative learning, opinion mining	i.a.: Girgensohn/Lee (2002); Hapke (2007); Schmidt (2007; 2008); Mislove (2007); de Rosa (2007); Das et al. (2008); Goo/Foh (2008); Heckner/Wolff (2008); Soboroff et al. (2008); Mühlbacher (2009); Warr (2008); Peters (2009); Kepp/Schorr (2009); Zhao/Rosson (2009); Griesbaum/Kepp (2010); Hellmann et al. (2010); Morris et al. (2008; 2010); Špiranec/Banek Zorica (2010)
Computer Science	data mining, opinion mining, social network analysis, social recommender systems	i.a.: Hu/Liu (2004); Chen (2009); Doniec et al. (2009); Berendt et al. (2010); Tseng (2007); Schulz et al. (2010); Russel (2011);

Since the web 2.0 and social software have become a technological and societal phenomenon of widespread significance to many aspects of our everyday life, almost every scientific discipline has dedicated its efforts to better understanding the impact of these developments in this perspective. The focus of this section, however, shall be to give a short overview of the areas of research on social software related to the interest and setting of this thesis. A more detailed review of the consideration of social software in INSU research will be presented in section 1.1.

First and foremost, the development of new web services and types of applications is driven by economic interest. Researchers from economics and business studies continue to analyze the impact of social software on operational processes, business models, as well as aspects of organizational knowledge management. With its collaborative paradigm, social software has been associated with bottom-up management concepts in a variety of business domains. The research most relevant to this study, however, mainly focuses the way social software may support the identification of experts and support collaboration in informal networks in an organization. Furthermore, studies on personal information management in the workplace and the concepts of social tagging and crowdsourcing have been undertaken. As the lines between knowledge management and workplace learning are blurring (cf. Bohl/ Görtz 2009), the areas of economics and business studies have a strong linkage to educational research.

Educationalists and educational researchers have produced a variety of publications on social software and its impact on learning theory, design and delivery. Approaches on how to use social software in the field of computer-supported cooperative learning have been developed. As a result, existing solutions of formal learning have been reconsidered and a shift towards informal learning, self-direct learning and most importantly the notion of competence development may be observed. With the development of the learning theory of *connectivism* (cf. Siemens 2004) this shift has also been documented on a theoretical level. By including technology and connection making as learning activities, this theory begins to move learning theories into a digital age. Its main observation is that individuals derive their competence from forming connections and learn based on experiencing the diversity of opinions within one's network (Ibid.). Such considerations draw the connection back to research in the workplace environment as mentioned earlier.

Whether in an organizational context or not, social software has a strong impact on how people connect and interact with each other. In the past ten

years, academics in psychology and sociology have conducted countless studies addressing arising questions regarding virtual relationship building, deindividuation effects, virtual identity and the concept of social capital and trust in online networks. Additionally, societal and demographic developments in accordance with social software usage and adaption have been studied (see also section 1.1). These findings are relevant for the design of socio-technical systems and a deeper understanding of individual as well as group behavior. Accordingly, this research perspective is highly interconnected with the other disciplines mentioned above, since its results provide a solid basis for each of the considerations regarding social software in the workplace environment. Basically, it can be said that all research on social software is of an interdisciplinary nature; regarding its perspective as well as applied methods. This is best illustrated by the research activities in information science.

While information science has always considered itself to be interdisciplinary (cf. Borko 1968), social software, as object of investigation, has even amplified this principle of scientific research. In both the system-oriented as well as cognitive perspective a wide field of research focusing on or touching the above described phenomena of social software has been developed in the past ten years. Fundamentally, the understanding of information literacy ('*information literacy 2.0*'[19]), information brokering and information retrieval had to be reviewed. From a system-oriented perspective, new ways to incorporate user-generated and highly dynamic information objects in information retrieval have been investigated. As the concept of social tagging and the resulting folksonomies represent a type of intelligent selection and indexing of corpora, information science needs to concentrate its attention on the integration of these phenomena in existing web information retrieval approaches. From a cognitive perspective, the participative web brought about a variety of issues regarding usability and graphical user interface design. Designing interfaces for enjoyment and social interaction varies significantly from former approaches, which were characterized by measures such as effectiveness and efficiency. The resulting considerations have opened a wide field of re-

19 Špiranec and Zorica (2010) discussed this term (introduced by Hapke 2007) in order to describe that the new meaning and understanding of the central conceptions in information literacy are shifting the focus of classical information literacy to a new kind of '*information literacy 2.0*'.

search regarding conception, design and evaluation of social software development.

In addition, there are also first initiatives to include social software into the field of IS&R research. The basic consideration therein is that the information seeking behavior of cognitive actors is enhanced by a social dimension of interaction due to the emerging user-generated content and growing participative component of Internet services. Here, a distinction has been made between 'direct' and 'indirect social interaction' (cf. Heckner/Wolff 2009). 'Direct social interaction' is a component of information seeking behavior, which has always been considered in existing information seeking models as a form of communication and exchange in between cognitive actors. The rise of social software applications, however, has changed the method of interaction. Therefore, the concept of 'indirect social interaction' (cf. Goh/Foo 2008) relates to the artifacts of information resulting from direct interaction between users. Based on user-generated content such as texts, tags and relationships between users or bookmarks for example, conclusions can be drawn as to how to design 'social information retrieval systems'.[20] Such considerations and studies primarily aim at optimizing web search engines based on collaborative elements of social software[21], which is associated with HCI and IR research. In this context, a variety of initiatives have emerged that address the impact of the participative web. Soboroff et al. (2008) argued for the introduction the ACM workshop on search in social media with the following statement:

> "The purpose of this workshop is to bring together academic and industry researchers in information retrieval and social media to consider the following questions: How should we search in social media? What are the needs of users, and models of those needs, specific to social media search? What models make the most sense? How does search interact with existing uses of social media? What works and what does not?" (Ibid.)

Among others in this workshop, Das et al. (2008) presented findings on how to utilize the above mentioned artifacts of so-called 'indirect social interac-

20 The fields of '*collaborative information retrieval*' or '*collaborative information seeking*' are dedicated to this research interest. Therein, a collective information need of a group of actors is assumed and their interaction in the course of a search session is considered (cf. Baeza-Yates & Pino 1997).

21 As for example Morris et al. (2008) in their studies on optimization of collaborative web search by personalization.

tion' to rank items in the neighborhood of a user. They argue that "[…] as online social networking emerges, there has been increased interest to utilize the underlying social structure as well as the available social information to improve search" (Ibid.: 67). This reveals how social software strongly affects the design of information retrieval systems and thus is part of a variety of studies in this field of research[22]. While this is part of the system-oriented perspective of IR research, there are also first approaches to analyzing social software in INSU research (see section 1.1).

Finally, there is a very active stream of research at the interface of information science and computer science. By employing data mining techniques, researchers in this field aim at gathering a better understanding of how to make sense from the tremendous amount of valuable social data and recognize patterns, trends, or additional information. Since this cluster of literature has a strong focus on algorithms and technologies without paying closer attention to the context of use and aspects of informational value and knowledge, it shall not be of central interest to this dissertation.

This thesis aims to add to these most current research activities. The exemplary presentation of related research on social software may not give an overview of all activities in this field. It shall rather highlight the relevance of this subject matter and help better understand research activities adjacent to this doctoral dissertation. The core difference between the majority of these research areas and the present study is that the former focus mainly on the aspects of interpersonal collaboration processes of social software. As explained in section 1.1, however, the scope of this thesis is the cognitive perspective on the individual use (perception) of social software as source of information, more specifically its role for the information seeking process of young professionals in the workplace environment.

22 In addition to the fields of research mentioned earlier, these are '*social search*' (e.g., Evans/Chi 2008), '*social Q&A*' (e.g., Shah et al. 2009), and others that do not match with the research perspective, the scope, and level of detail of this doctoral dissertation but shall be considered as related areas of research.

2.2 The notion of a 'net generation'

As indicated above, the rise of social software applications has been associated with younger age groups in many aspects. Many of the popular social software applications and concepts have predominantly been picked up by adolescents and largely male users with a high affinity of Internet technologies. Some studies found 14- to 29-year-olds to be represented above average in the group of web 2.0 users (cf. Gerhards et al. 2008). Many others have further analyzed the media and web usage of young adults as pioneers of social software and user-generated content (see section 2.2.2). Together with this observation, several authors have associated certain characteristics and behavior with the group of people born after 1980 (cf. Palfrey/Gasser 2008; Schooley 2005; Tapscott 1998), 1977 (cf. Jones/Fox 2009) or simply with those born around the time the PC was introduced (Oblinger/Oblinger 2005; Prensky 2001). The common theme of these studies is that today's adolescents grow up in a technology-driven environment, where trust in technical feasibility is omnipresent. The everyday life of the youth (e.g., dates, mobility, hobbies and information gathering) is constituted by technical references (cf. Tully 2004: 14 ff.). The impact digital technology is having on today's society is considered to be radically different from previous inventions. While older members of society have witnessed this change, the above mentioned group of individuals has never experienced life without digital technology. Prensky (2001) distinguishes these '*digital natives*' from people who need to adapt from their previous to this new environment, called '*digital immigrants*'. He describes this observation as follows:

> "Today's students have not just changed incrementally from those of the past […]. A really big discontinuity has taken place. One might even call it a "singularity" – an event which changes things so fundamentally that there is absolutely no going back. This so-called "singularity" is the arrival and rapid dissemination of digital technology in the last decades of the 20th century." (Ibid.: 1)

The characteristic behavior associated with this group of people is oftentimes exemplary shown by means of the use of social software. As this group is considered to be the first to be 'bathed in bits', its members have also been called part of a '*net generation*' (cf. Tapscott 1998; Hebecker 2001). In a variety of studies and in popular media this terminology has been picked up and a wide set of common assumptions about this new demographic cohort developed. For the interest of this study, it is essential to understand these stereotypes and hypotheses derived from these.

2.2.1 Common assumptions of 'digital immigrants' about 'digital natives'

Following Prensky's (2001) terminology in his differentiation between those individuals that naturally interact with digital technology in a manner inherent in their common behavioral patterns and those that need to adapt and learn new behavior, this section presents the common assumptions expressed in a variety of popular publications by the latter. As indicated above, this external perspective describes the interaction of adolescents and emerging technologies with a certain amazement or even admiration. Many times the characteristics associated with members of the *net generation* do not solely refer to the way they interact with technology. This can be seen especially in business-related studies which sketch an image of a part of the workforce with a whole new set of attitudes and capabilities. In this context, the millennials are often described as team-oriented, collaborative and confident (cf. Howe/Strauss 2000). In their article "Meet the Net Generation" Geraci et al. (2006) even identified eight 'millennial norms', which distinguish this group of employees from other members of an organization's workforce. They proclaim that in regards to freedom, customization, scrutinization, integrity, collaboration, entertainment, speed and innovation, *digital natives* share a new set of beliefs and attitudes. While it is not conducive to go further into the idea of attitudinal commonalities of *digital natives*, the assumptions about differences in the interaction with technology and usage of information sources compared to *digital immigrants* deserve a closer look in the light of the research interest of this thesis.

Palfrey and Gasser (2008) described their assumptions about adolescents and their way to study, work, write and interact with each other as follows:

> "They read blogs rather than newspapers. They often meet each other online before they meet in person. They probably don't even know what a library card looks like, much less have one; and if they do, they've probably never used it. They get their music online – often for free, illegally – rather than buying it in record stores. They're more likely to send an instant message (IM) than to pick up the telephone to arrange a date later in the afternoon. They adopt and pal around with virtual Neopets online instead of found puppies. And they're connected to one another by a common culture. Major aspects of their lives – social interactions, friendships, civic activities – are mediated by digital technologies. And they've never known any other way of life" (Ibid.: 2).

This description expresses the comparative perspective *digital immigrants* naturally start from. They refer to the technologies and media that constituted their living environment when growing up and identify how young adolescents are not aware of these anymore. In regards to learning, seeking and using information, *digital natives* are believed to prefer turning to digital resources rather than traditional information sources. In addition, it is proclaimed that they have the competencies to assemble digital resources independently and construct their own information environments: "Digital resources enable experiential learning – something in tune with Net Gen preferences. Rather than being told, Net Geners would rather construct their own learning, assembling information, tools, and frameworks from a variety of sources" (Oblinger/Oblinger 2005: 212). This view is also supported by Palfrey and Gasser (2008) who said that today's young adolescents

> "[…] are joined by a set of common practices, including the amount of time they spend using digital technologies, their tendency to multitask, their tendency to express themselves and relate to one another in ways mediated by digital technologies, and their pattern of using the technologies to access and use information and create new knowledge and art forms." (Ibid.: 4)

Following these assumptions about the *digital natives* and the way they seek and use information in digital resources, especially the Internet, the *digital immigrants* discuss how to react to these developments. As described in section 1.1 this applies primarily to the transformation of the workplace environment. The following statement is an example of one of the conclusions that results from the discourse described above:

> "There are two possible paths before us – one in which we destroy what is great about the Internet and about how young people use it, and one in which we make smart choices and head toward a bright future in a digital age" (Ibid.: 7).

Before commenting further on such conclusions, the following section will provide a more sound understanding of the way digital technology is used today, especially in the everyday life of young adults.

2.2.2 Statistics on social web usage of young adolescents

In the past five years, a variety of studies have been conducted to better understand the media and web usage of young adults with a particular focus on

the role of social software. The well-known 'ARD/ZDF online study'[23] included the potential of the web 2.0 in 2006 for the first time. In their first evaluation of social web usage the authors of this study found that a quarter of all German Internet users above 14 years of age were interested in web 2.0 services. While this number revealed that users were then still quite reserved regarding the active online participation on such platforms, the group of 14–19 year olds was already represented with 37%. Thus, the very early adopters were those young adolescents, which were characterized in the study as 'young hyperactives' that use the Internet in a dynamic and active way. However, the main use of such web services as *Wikipedia*, *Flickr*, or blogs was passive. Those participants that had used these sites before replied that they had done so primarily to seek information (e.g., *Wikipedia* 92% / blogs 64%) and not to actively publish content (cf. Fisch/Gscheidle 2006: 435 ff.).

Table 3:
Occasional and regular web 2.0 usage of 14–19 year olds in Germany

	occasional use (%) (at least sometimes)			frequent use (%) (at least weekly)		
	2007	2008	2009	2007	2008	2009
Wikipedia	82	91	94	50	50	48
video portals (e.g., *YouTube*)	69	90	93	49	60	79
private networks and communities	40	68	81	24	54*	69*
photo communities	26	38	42	10	15	18
professional networks and communities	11	8	6	4	3*	2*
weblogs	18	9	12	9	3	4
social bookmarking	3	5	9	0	1	4
virtual worlds / online games	7	11	-	4	4	-

overall basis = all online users > 14 years in Germany (2007: n = 1142; 2008: n = 1186; 2009: n = 1212)
here: selected sample of 14–19 year olds (2007: n = 138; 2008: n = 141; 2009: n = 139)
* users with own profile

(translation of Busemann/Gscheidle 2009: 361)

23 *ARD* and *ZDF* are the two major public broadcasting stations in Germany and publish this widely received study on the usage of online media yearly.

Thus, the conclusion of this first evaluation of the use of the social web by the German Internet population was that the 'participative web' was still in its infancy but found the group of 'young hyperactives' at its forefront. Focusing on the group of young adolescents, the study series reveals over the following years how web 2.0 usage has evolved. The overall usage of the above mentioned services has increased significantly between 2007 and 2009 (see table 3) and provides further proof for the above described assumption that the phenomena of the social web are imminently connected to a new generation of Internet users. Especially the usage of *Wikipedia*, social sharing platforms, online social networks and online photo communities has reached a high degree of popularity with almost every Internet user below 19 years of age.

These statistics show also that not all types of social web services have received an increasing amount of attention. The usage of video portals, online social networks and wiki-based online encyclopedias has continuously increased over the years, while more specialized services such as professional online communities, weblogs and social bookmarking seem to fall short of expectations (cf. ibid.: 358). Among the popular web 2.0 sites however, especially social networking services are used very frequently among teenagers. 74% of them are members of at least one private online social network of which 43% log in on a daily basis (cf. ibid.: 359).

Compared to the other age groups of the study, the ARD/ZDF study comes to the conclusion that the younger the Internet user the higher the degree of usage and active participation in the social web. Even in 2009, however, the main reason people turn to these web services is because they seek information and passively consume the websites' content (see figure 4).

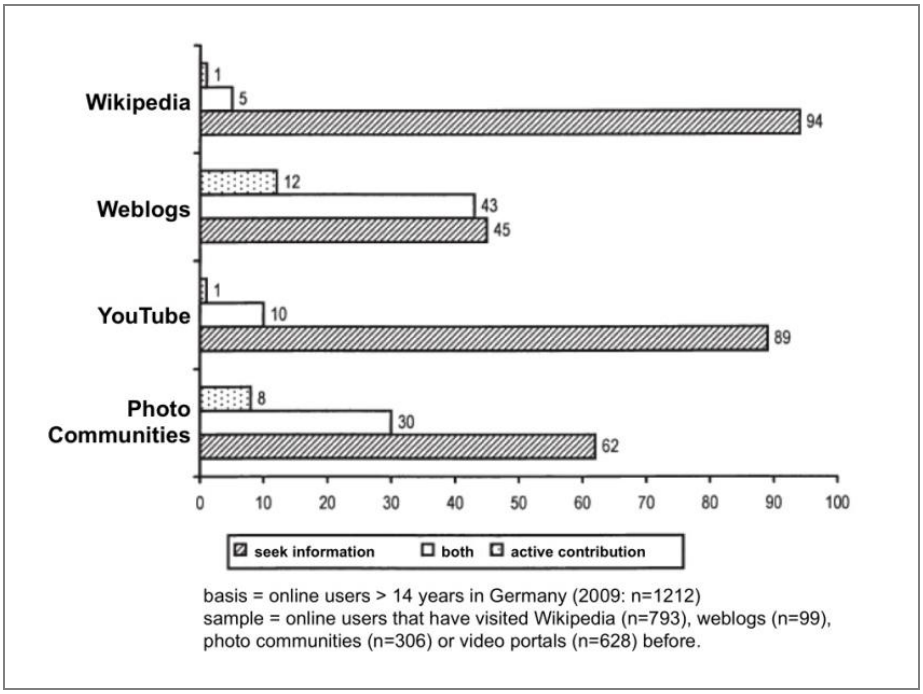


Figure 4 Active and passive use of web 2.0 services
(translation of Busemann/Gscheidle 2009: 362)

94% of the users of the *Wikipedia*, 89% of *YouTube*, 62% of photo sharing platforms and 45% of weblogs users responded that they visited these sites in order to seek information. The common association that social software applications change the face of the Internet by adding the dimension of user participation and content generation (see section 2.1) definitely is not false but appears in a different light when considering the usage behavior presented in this German survey on media usage. This becomes even more evident when considering the classification of web 2.0 that resulted from a study conducted by Gerhards et al. in 2008. They confirm the above mentioned usage statistics by identifying a large share of ‘info seekers’ and ‘entertainment seekers’ among the population of their survey (see figure 5).

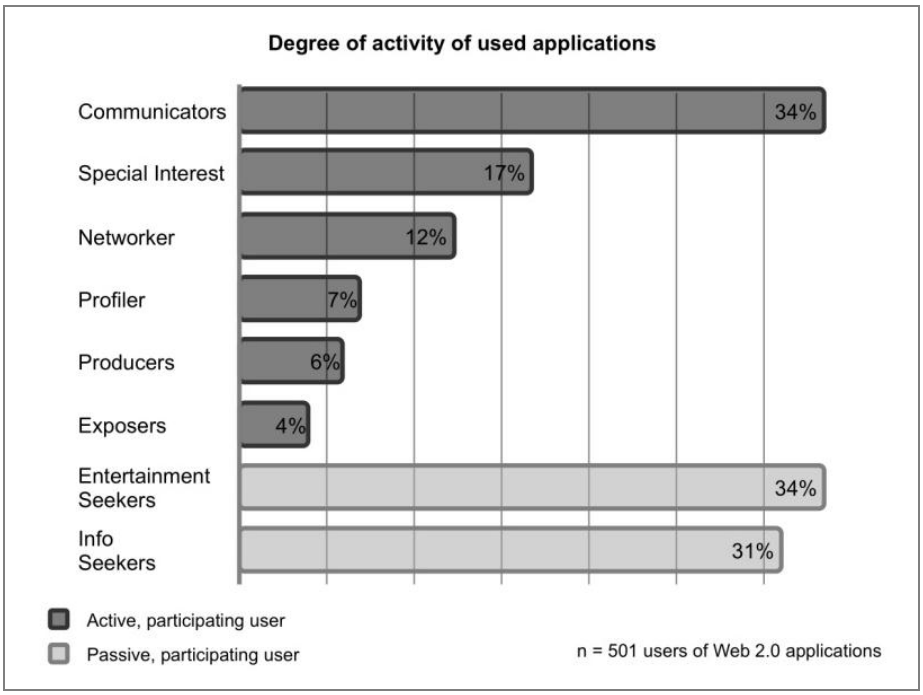


Figure 5 Classification of web 2.0 users (adapted from Gerhards et al. 2008: 147)

They characterize the former as group of users that primarily consumes social web content and does neither visit these sites for communicative nor creative purposes. The only way contribution occurs is by asking questions or sporadic comments. It is claimed that 'info seekers' basically use web 2.0 services just like the web 1.0. Still, a crucial motive for turning to such sites as sources of information is that they offer rather authentic and diverse user generated content that may be more targeted and result from collaborative processes (cf. ibid.: 145). This observation was also confirmed by a study on Internet activities of young Europeans. Lusoli and Miltgen (2009) grouped the respondents of their survey into 3 clusters based on the Internet activities they prefer and found that 4 activities make the difference between the clusters. The first cluster (48%) equals the above described phenomenon of Internet users who

> "[…] only do old and classical Internet. The second cluster (18%) represents people who use all the social possibilities of the Internet such as keeping a blog and participating in online discussion forums and chats. The third cluster (34%) represents [...] Internet users who also use social networking sites and sites to share pictures and videos." (Ibid.: 33)

These observations are consistent with other studies across Europe and North America. First of all, it can be summarized that the degree of social web usage across the entire Internet population is highest among young adolescents. This specifically applies to social networking services as well as social sharing sites. Even though the *Wikipedia* appears as the most popular example of the social web, wikis in general cannot be considered frequently used, especially in regards to active participation. This leads to the second central finding of the above presented statistics. Even though the web 2.0 can be considered a participative web, where the websites serve as platform for user generated content and interaction (see section 2.1), the gap between active and passive use of these services needs to be acknowledged. These two main observations represent an essential foundation for the research interest of this thesis. Regarding the use of social software in the workplace, the before mentioned ASTD study comes to the conclusion that

> “[…] the sheer amount of usage tends to differ by age group. Members of the Millennial generation use social media at work to a greater extent than members of Generation X, who in turn use it more than Baby Boomers. Millennials also spend more time interacting with social media each day than the older generations. About one third of Baby Boomers said they used social media for work from 30 minutes to more than an hour each day, while 45 percent of Millennials said the same. These tools are used at work most often to find resources more easily and to improve knowledge sharing and communication. People are less likely to report using them to solve problems more efficiently or to increase participation in learning.” (ASTD 2010: 362)

This is where we have come full circle back to the introductory considerations of section 1.1 and the notion of generation-specific behavior in the interaction with digital technology.

2.2.3 Limitations of the generational concept and the sample group of ‘young professionals’

In regards to the notion of a ‘net generation’ a few remarks shall be added in order to define the further use of terminology in this thesis. According to Schulmeister (2009) there is reasonable concern against such generational concepts as ‘millenials’, ‘net generation’, or ‘digital natives’ and a need to gather further empirical data before drawing scientific conclusions on the general media usage of children and teenagers. This reservation is caused by the use of the notion of a generation on the one hand and the ambiguous em-

pirical value of the media and web usage statistics of young adults presented above on the other.

Across scientific disciplines and cultural backgrounds various approaches have been developed in order to classify certain groups within society. It is the common understanding that a generation is considered more than "[…] the average interval of time between the birth of parents and the birth of their offspring" (cf. Strauss/Howe 1991). Notably a generation is characterized by collective memories, participation at common destinies and by sharing a common set of values or traits.[24] These characteristics disclose the influence of cultural backgrounds on the segmentation of a society, since such collective traits, for example, vary from culture to culture. Schooley (2005) summarized the main US-centered understanding of the demographic structure of today's society as follows:

> "Today's workforce has four generations – the Veterans (born between 1922 and 1945), the Baby Boomers (born between 1946 and 1964), Generation X (born between 1965 and 1980), and the Millennials, also called Generation Y (born between 1980 and 2000) – and they each come to work with their own mindset." (Ibid.: 5)

Compared to the German perspective, it is obvious that such classifications as 'the Veterans' or 'Baby Boomers' would not correctly reflect history and culture of the German society. Other terms such as 'Kriegskindergeneration', '68er', 'Generation Golf', or 'Generation Praktikum'[25] dominated the societal German discourse. They are based on culturally innate and collectively perceived traits and events.

Even within the American scientific discourse, however, the denomination of these cohorts varies. Tapscott (1998), for example, called the generation of students born after 1980 'net generation'. German literature also picked this term up. Regardless of the interculturally diverse classification of generations, it can be observed, that the term 'net generation' itself has been

24 The scientific discourse regarding generational studies is an integral part of sociology. Therein Karl Mannheim (1928/29) developed the here mentioned classification of characteristics.

25 These generations refer to the children growing up in WWII ('Kriegskindergeneration'), the members of the pacific civil movement at the end of the 1960s ('68er'), the cohort of people born between 1965 and 1975 coined by hedonism, pop culture, and brand awareness ('Generation Golf' – as reference to the Volkswagen Golf), and the negative economic development confronting young professionals with endless internships in the 1990s ('Generation Praktikum').

dominating the discussion of demographic change in today's workforce. This may be caused by one central aspect: the growing interconnectivity of cultures and the emergence of a global community. Since many of the events, destinies, artifacts and characteristic values are collectively experienced or developed within the realm of the Internet, geographical and political barriers lose their influence. As such, the *net generation* often is considered a global phenomenon. Computer-mediated communication, online social networks and access to user-generated content on the Internet are said to be inherent in this group of today's society. In the American scientific discourse, there seems to be a common understanding that this indeed constitutes a new generation; regardless of which it is called 'net generation', 'millenials', or 'generation Y'. In the German discussion, there is consensus to the general observance of a new degree of media exposure. However, there is disagreement whether indeed solely the access to new media is argument enough to call it a new generation or whether this even allows conclusions about cognitive processing, social behavior, or a common set of values as claimed by Prensky (2001) or Oblinger and Oblinger (2005). Sackmann and Weymann (1994) already observed that young cohorts tend to adapt to new technologies and develop the required competencies first. They also came to the conclusion that the correlation between age and technical competency decreases with the aging of innovations themselves (cf. ibid.: 64).

In the context of learning theory this discussion is also of significant relevance. Does such a possible *net generation* indeed show a particular learning behavior? Seufert (2007) commented on the hitherto existing research and public opinion: „Die Argumentation, dass neue Kompetenzen aufgrund der veränderten Mediennutzung ein Potenzial für das Lernen darstellen, stützt sich dabei jedoch vor allem auf Einzelbeobachtungen"[26] (Ibid.: 9). Accordingly, Schulmeister (2009) called for a scientific discussion and empirical assessment and questions the existence of a *net generation* (Ibid.: 3).

This doctoral dissertation aims to add a scientific voice to this discussion. However, in contrast to the perspective of the above mentioned sociologists or educationalists, the discussion whether such a generation indeed exists shall not be of central value. The term 'net generation' therefore shall be omitted in order to account for the discussion described above. Instead, the sample group of this study shall be classified as '*young professionals*'. This

26 "The argument that new competencies are gained through a modified media usage and bring out a new potential for learning is mainly based on isolated observations."

concept generally refers to a young person of a high level of education that has recently started his professional career. Since it avoids the portentous generational notion of Tapscott (1998) and others, research on *young professionals* does not discuss about certain birth cohorts. Subjects of this study are considered to be junior employees less than 32 years of age, entering the workforce on the entry levels without or with little previous job experience. As the above mentioned statistics and common assumptions about this group of people have shown, there are good reasons for presuming a stronger affinity to modern web phenomena of social interaction, communication and collaboration. Therefore, the idea of common behavioral patterns of young professionals is an important input to the research interest of this study. While other scientific fields, however, incorporate a comparative, intergenerational perspective, this study analyzes the usage patterns in information seeking within this group of interest. Even though it is not the aim of this study to directly address the questions of the here described scientific discourse, it can consequently be understood as a reply to Schulmeister's call for further empirical data on the behavioral patterns of young adults in their interaction with a new form of software applications. Of course, a workforce always is a mixture of generations with some more and some less technologically literate employees. But since attrition of the existing workforce and recruiting of new employees is an important driver for change in the industry of management consulting, the sample group of young professionals is of central interest of this study.

2.3 Social software in the workplace

Not only the above described sample group is specific to this thesis, also the perspective on social software in the workplace environment is a central characteristic of its research interest. Since web services such as *Blogger*, *Facebook*, *YouTube* and *Wikipedia* populate the first ranks of web usage, they have received a lot of attention in traditional media, society and even politics. The emergence of the above described type of software and concepts of collaboration and content sharing has naturally not remained unnoticed by corporate organizations and presents them with several challenges. For them it means that they have to develop new strategies on how to communicate

and nurture their brand image, monitor possible issues and customer complaints, sell or even develop new products and even hire employees by engaging in the social web. Furthermore, today's companies would like to benefit from these new trends of collaboration, networking, information sharing and communication with regards to internal processes of knowledge management, learning and team productivity. This might mean to open the corporate information environment to public services of the social web or even copy the concepts of these sites and create internal social software applications. While many organizations are highly skeptical about the former, the latter has been approached by numerous – mainly large-sized – corporations.

Still, a lack of practical as well as scientific understanding has created insecurity whether the use of social software in the workplace should be encouraged. Amongst others, reports such as the following have fueled these discussions: The "IT services group Morse conducted a survey, questioning 1,460 office workers, and came to the conclusion that use of Twitter and other social networking sites is costing UK firms £1.38 billion (approximately 2.25 billion dollars) every year" (Schroeder 2009). According to the study, employees spend 40 minutes every week, on average, on social networking sites. Based on the assumption that these minutes may not be considered work-related, social media is considered to cost the organization's productivity. As an example of these technology-averse voices, the *Morse* study thus questions the economic value of social software in the workplace.

In addition, social web services are often considered to allow for possible security breaches. Employees might not be fully aware of existing means to protect their data privacy and share confidential corporate information with untrustworthy contacts or communities. Thus, German DAX companies, e.g., *Commerzbank*, *HeidelbergCement*, *Porsche* and *Volkswagen*, have been reported to block social media from the workplace to a large degree (Spiegel Online 2010). In order to avoid a loss of productivity and protect confidential information and data security (against malware), their employees are not allowed to access the social web from their corporate PCs. This discussion is also highly prevalent in the U.S., where "[…] only 10% of the 1,400 CIOs interviewed [in a study commissioned by Robert Half Technology] said that their companies allow employees full access to social networks during work hours" (Gaudin 2009). This is not to say that these sites are entirely blocked by corporate firewalls, however these discussions have led to a higher awareness of possible confidentiality and security issues. As a result, various organizations have started to create internal social media guidelines. Em-

ployees are given precise rules on how to deal with the private and professional use of social web services. The U.S. Department of State Foreign Affairs (2010), for example, has issued a manual on information management, defining the personal and official use of social media in detail. It explicitly supports the use of social software in the workplace:

> "As a general matter, the Department encourages the responsible use of social media consistent with current laws, policies and guidance that govern information and information technology. Department organizations will not arbitrarily ban access to or the use of social media." (Ibid.)

This is an example of the rather technology-friendly perspective where organizations see a benefit in offering their employees access to social web services, provided that they observe such corporate guidelines. In the course of this doctoral dissertation the briefly touched management concerns and challenges for the use of social software in the workplace shall be analyzed closely in order to provide a basis for assessing the results of this study for a certain context and their pragmatic value and possible limitations.

First of all, however, an overview of statistics on the use of social media at work will be given in the following. Then, the transfer of the phenomena and benefits associated with this type of media from the social web to corporate intranets will be elaborated. And finally, the perspective on social software is focused on its user-generated content as a possible source of information. These aspects are presented in order to convey the primary considerations regarding the use of social software in the workplace.

2.3.1 Use of social media at work

The emergence of social software applications has given rise to the initial studies on their usage in the workplace environment. One example is the 'Social Media and Generations Survey' by the American Society for Training & Development (ASTD) and the Institute for Corporate Productivity (i4cp) conducted in 2010. This survey collected answers from 3760 employees across different organizations regarding their use of social media and attitudes towards this type of software in their workplace environment. This data was combined with a market performance index which is based on self-reported performance in the areas of revenue, market share and profitability of the respective employers (cf. ASTD 2010: 9). The overall perspective of this study was to examine how organizations are using and should be using these technologies to achieve maximum benefits. While the level of orga-

nizational performance is not of central interest to this thesis, the results of this study provide preliminary insights into the use of social media at work in general.

According to this large-scale, North-American survey, the most common reasons why people use social media on the job are to find resources more easily and to improve knowledge sharing (as shown in figure 6) This opens up a whole new perspective on a web phenomenon, which is mostly considered to serve as entertainment and leisure. With 38% and 35.6% of the respondents answering that they use social media technologies[27] to a high or very high extent for work-related purposes, this study provides a sound basis for the legitimate research interest of this thesis.

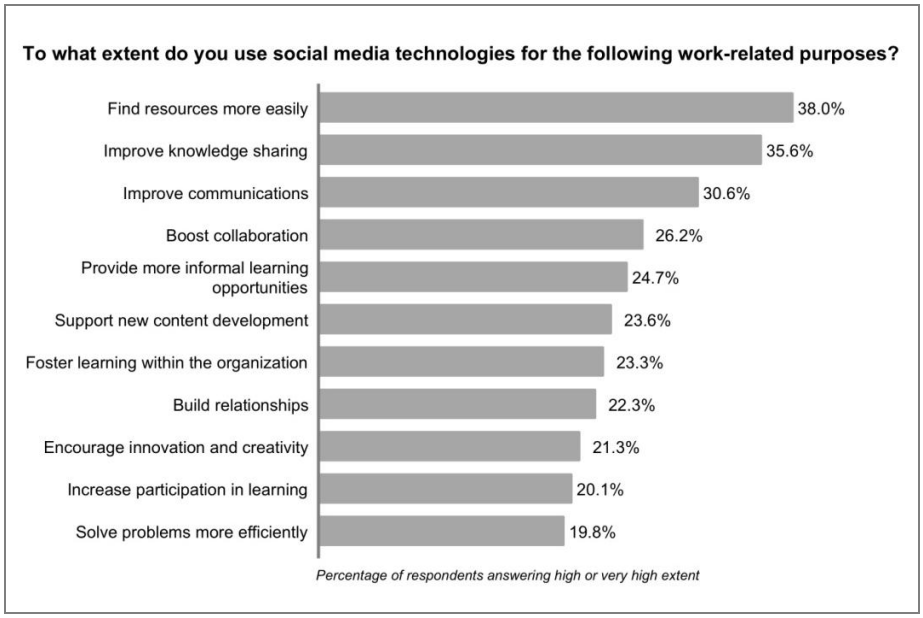


Figure 6 How people are using social media at work (adapted from ASTD 2010: 18)

However, for all usage scenarios that were investigated by the study, the overall usage was rather moderate. This indicates that, on the whole, organizations and employees have not yet intensively used social media technolo-

27 The ASTD study (2010) uses this term in reference to social networks, shared workspaces, shared media, podcasts, wikis, blogs, microblogs, social bookmarking, virtual worlds, and augmented realities (cf. ibid.: 12) and therefore can almost be considered congruent with the term social software used in this dissertation.

gies for work-related purposes. This may be due to certain reservations among corporate leaders but also is an indication that there is a lack of structured approaches to integrating social software into the electronic information environment. The development of which is the goal of this doctoral dissertation, especially since the participating employees answered that they find these technologies valuable for work-related learning. As figure 7 shows, there are a variety of social software applications that employees consider to provide added value to their daily work: social sharing services for the exchange of videos or pictures, podcasts for the distribution of audio files, wikis for workplace collaboration and further tools such as blogs or social networking services.

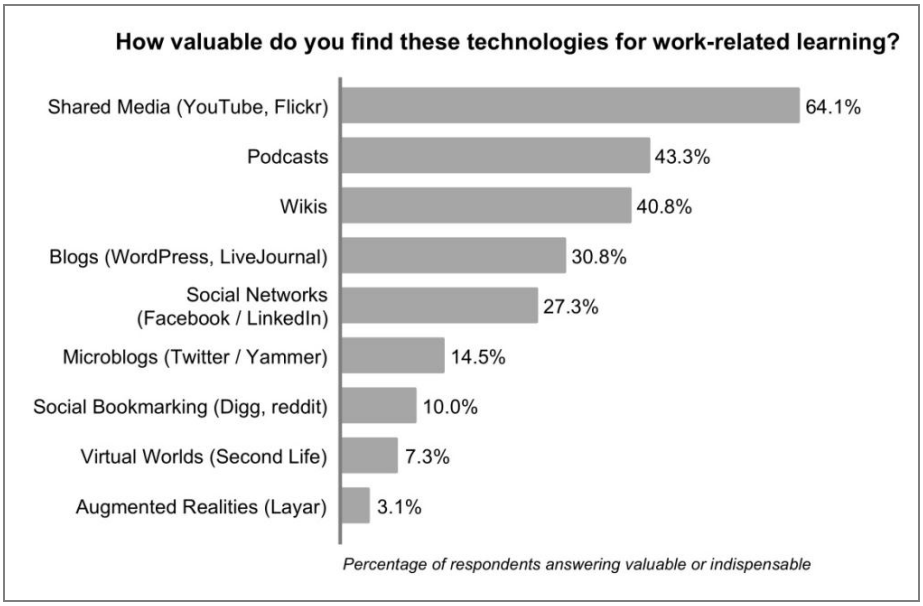


Figure 7 Value in using certain social media tools for learning (adapted from ASTD 2010: 27)

However, these positive associations of the use of social software do not seem to have reached a sufficient level of maturity to actually increase the usage of these applications in the workplace environment. As indicated above, the survey revealed that the overall use of social software is relatively low. Only regarding social networks did more than half of respondents say they used these tools often or all of the time (cf. ibid.: 12). Especially regarding the use of this type of applications for work-related purposes these di-

verging findings may partly be due to a lack of formal policies. Only 44.4% of the respondents said that their employer provided such a guideline regarding the use of social media on the job. Summarizing the results of this study, Tony Bingham, CEO of ASTD, stresses that "[…] understanding how to use web 2.0 technologies – and the huge impact they have on how the workforce learns and communicates – is critical to engaging employees and customers, and ultimately, critical for an organization's growth and success" (Ibid.: 5).

There seems to be legitimate reason to assume that the use of social software in the workplace promises added value in regards to how employees find resources more easily, improve knowledge sharing, improve communications and boost collaboration. The results of such studies as the above presented, however, raise the concern that it requires a structured approach regarding formal policies, internal use cases and processes in order to leverage its aspired potential. Especially since the general usage of such applications as online social networks or social sharing services is constantly increasing (see section 2.1).

In his 'blog about information', JP Rangaswami, from *BT Design*, developed a rather positive vision of 'the Facebookisation of the enterprise'. He draws the picture of an enterprise world, where all virtual and tangible aspects of the workplace follow the rules of the social web. Following this idea, he transfers the essential concepts and functionalities of *Facebook* into the daily work routine of a common workplace. He asks the reader to imagine

> "[…] coming to work, booting up your laptop and being presented with something akin to Facebook. Where, immediately, you see a bunch of news events about things at work you are interested in. [...] Where you can tell people what you are doing and poll people to ask them their opinion on things. Where you can share information about the things you are working on. […] Your network of relationships actually described the people you spoke to, spent time with, worked with." (Rangaswami 2010)

With this rather drastic and – in parts – provocative scenario Rangaswami highlights the user-centeredness and bottom-up paradigm of the social web and what they could mean to the design of a corporate information environment. Of course, this may only be understood as a fictitious mind exercise, but it expresses two central aspects relevant to the research interest of this thesis. On the one hand, this vision expresses the idea that a new generation of employees would likely expect certain functionalities and concepts it has learned and adapted from its usage of social web services such as *Facebook*. On the other hand, it brings attention to a different side of social networking

other than mere entertainment and diversion: the added value of social information exchange and collaboration of online social networks. Rangaswami consequently demands in his blog entry: "Let's harness the power of social networking tools, make them work for us in the enterprise" (Ibid.).

While his vision may only serve as an excursus to provoke a new perspective on social web services, this final statement provides a fine summary of the central idea of moving from the social web to a '*social intranet'*. As shown by the statistics presented above, there is reason to consider enabling an organization's employees to access social media in the workplace. Apart from its private usage for social networking, leisure and entertainment, there seem to exist a variety of use cases where the social web may enhance collaboration and productivity. Still, the discussion regarding possible security and productivity concerns against opening an organization's information environment remain. Thus, enterprises are looking at how they can internally harness characteristic phenomena of the social web, such as flat hierarchies, teambuilding, collaboration and seamless information sharing without having to face the negative side effects of the public Internet. As mentioned earlier, many organizations therefore consider recreating successful social web services within their corporate intranets.

2.3.2 From social web to 'social intranet'

To understand the idea of harnessing social web phenomena and transferring them into corporate boundaries, one first needs to understand traditional concepts of corporate electronic information environments. Based on the need to distribute internal communication, share documents, standard forms and web-based applications relevant to a company's workforce, or provide secure access to certain Internet pages and electronic databases, almost every company currently offers their employees so-called '*intranet* or *enterprise information portals*'. Such "[…] workplace information environments have earned the attention of IR researchers due to the rapid growth of networked digital content in recent years" (Freund 2008: 28). These traditional intranets have reached a certain degree of complexity and size, particularly in large multinational organizations. In 2003, the IBM intranet for example contained more than 50 million unique URLs on at least 7,000 different hosts (cf. Fagin et al. 2003: 368). Still, an intranet portal represents a different information environment than the Internet, since its focus lies on the collection of elec-

tronic documents held in databases, e-mail repositories and shared directories, which are contributed and accessed by colleagues of one corporate organization (cf. Hawking 2004: 16). Thus, intranets and the Internet may have the same overall structure, namely a collection of documents connected by hyperlinks; they differ substantially, though, in the process of content generation. While the basic idea of the Internet and even more the social web is to grow more democratically, content generation in intranets historically used to be rather autocratic. This may be seen as an expression of the need and desire to guarantee a certain degree of quality and standardization of the information provided by an employer to its workforce. By providing a high-quality enterprise information portal, corporations aim at improving productivity and communication between individuals in an organization (cf. Fagin et al. 2003: 366). Now, even though the statement that "Intranets naturally tend to route around boredom" (Levine et al. 1999: 83) may be rather excessive, there lies some truth in it in relation to the overall acceptance and use of enterprise information portals. The idea of an internal 'knowledge capture', to which all employees contribute their job experiences and relevant information objects has often been disillusioned. Many of these approaches have failed due to a lack of employee commitment and corporate culture. Furthermore, the workplace environment typically is characterized by a high degree of time as well as career pressure, which further complicates the realization of successful knowledge sharing in the shape of enterprise information portals.

Considering the phenomena and popularity of the social web, the contrast of such public platforms and corporate intranets becomes evident. The rise of the user-driven concepts of online social networking, blogging and status messaging, social sharing and wiki collaboration have therefore awakened the desire of many corporations to harness the familiarity of their employees with such concepts for internal purposes. Accordingly, the different social software applications (social networking, blogs, social sharing and wikis) have been transferred into the corporate boundaries of enterprise information portals, while aiming to protect data security and meet privacy concerns. However, the concept of social networking is not really new to a company's information environment. Traditionally, large organizations have always provided access to information about the different organizational units and employees. This used to be simply a digital repository of an organization's yellow pages. Following the concepts learned from the social web, these pages today are enhanced by personal profile pages, visibility of connections be-

tween employees and the functionality of searching and adding new people to one's network (cf. Richter/Koch 2009). The personal profile pages are in some cases also connected to a company's skill management, as the example in section 5.3.5 will show. The motivation for an internal social networking service is the support of interpersonal knowledge exchange, expertise location and teambuilding. Furthermore, large companies aim at overcoming functional silos and enhance the integration of newcomers. Mimicking such web services as *Facebook* or *LinkedIn*, these internal social networking sites hope to bring new life to this aspect of a corporate intranet. Launching an internal communication platform for blogs, microblogs and status messaging is also based upon this idea. Enabling employees to write a blog entry about a recent work experience, post a short microblog about an interesting article they have read, or share a technical question in their status message shall enhance collaboration and information exchange between an organization's employees. The realization in a corporate intranet thereby provides a secure environment and allows for the exchange of confidential information. Picking up on the seamless and ubiquitous character of many of the public blogging services, this type of content may also be distributed via RSS feeds to desktop readers and mobile devices. This shall further support the accessibility and immediacy of employee collaboration and information exchange. As described above, one of the main traditional functionalities of a corporate intranet is the exchange and capture of electronic documents. In addition, the concept of social sharing is hardly new to enterprise information portals. The types of information objects and the way they are shared, however, differ significantly between social web applications and traditional intranets. While intranets focused on the structured collection of classic office document types, public social sharing services gained popularity because of their multimedia format (e.g., videos on *YouTube*, pictures on *Flickr* or presentations on *Slideshare*) or their specific content (e.g., bookmarks on *Delicious*). Another characteristic of social sharing applications are the ability to vote, comment and reply to content shared by other users. Imitating these aspects of social sharing applications, enterprise information portals move towards a more diverse form of knowledge capture and information sharing. This is achieved by supporting the upload of videos and podcasts, social bookmarking and offering such functionalities as comments, replies and tagging. Finally, one of the most prominent examples of the social web lends itself to be replicated within corporate boundaries: the wiki. Apart from the implementation as an encyclopedia, the concept and technology of a wiki is being used

in manifold ways within companies. The simple concept of a website that may easily be edited by any user may serve different purposes, such as technical documentation, project management and training and knowledge management. The fundamental idea is to tap into the 'wisdom of the crowds' and have many employees collaborate and contribute to a collective document collection without predefined structure and hierarchies. This concept usually is implemented in a so-called 'grassroots approach', which stands for are a decentralized, natural and spontaneous organization of activities. Many corporate departments have come to adapt this concept in internal applications, so that, e.g., *Siemens AG* is already facing a *Wikisphere* as sum of all internal wikis on a global scale of 600 production sites with about 400.000 employees (cf. Lindner 2008). The examples of internal social software applications show, that the shift from social web to social intranet may indeed be observed in a variety of cases. Section 5.3.5 will provide an impression of how all of these social applications may be integrated into an internal social software approach as part of an enterprise information portal in the given context of this study. Altogether, it may be concluded that not only the external social web but also the internal social software applications need to be considered when analyzing the role of social software in the workplace environment of young professionals in management consulting.

2.3.3 User-generated content as a source of information

Since all of the described types of applications have gained popularity based on the participation and content creation of their users, the type of content and its characteristics as source of information play an important role. Traditionally, the social web has been analyzed in regards to processes of collaboration and group interaction. Gerhards et al. (2008), however, analyzed the social web from a recipient viewpoint. As mentioned above, they classified three different types of web 2.0 users: 'producing users', 'communicating users' and 'passively participating users'. Based on their survey of users of social software applications (n = 501), they identified 'information seekers' to make up 31% of the user population. Gerhards et al. concluded that there is a large group of users that uses the Internet (and social web applications) solely in a receptive manner. Their only means of participation is to ask questions; public communication is restricted to sporadic comments. Essentially, this group uses social software platforms the way traditional web 1.0 services

were used. This observation is supported by a large online panel survey of 1,800 participants fielded in August 2009 by the Nielsen Company. In this study, three main web "[…] consumer segments using search (Searchers), portals (Portalists) or social media (Socializers) as their primary vehicle for content discovery" (Gibs 2009: 1) were identified. When asked about their initial starting point when looking for new information online, roughly 18% of users use social media as a core navigation and information discovery tool (see figure 8).

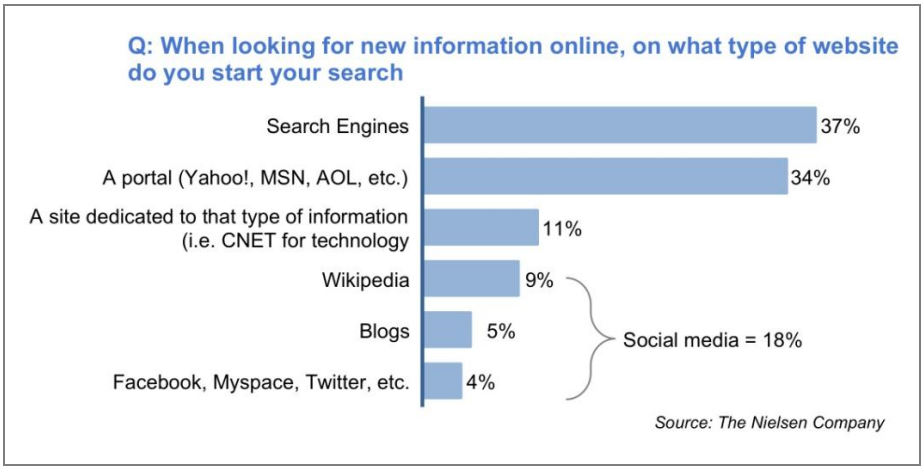


Figure 8 Social media – gateway for content discovery (adapted from Gibs 2009: 1)

Gibs explains this rising role of social media as source of information by the users' perception that there is too much information online. He discusses the example of a user who wants to learn about the latest smartphone released into the market. A common Internet search engines is easily able to provide him with a wide range of articles, test reports and commercial information about the device. But with the increasing number of information sources available, it becomes difficult to know which information is most accurate and credible. Gibs concludes that "[…] socializers trust what their friends have to say and social media acts as an information filtration tool" (Ibid.). While the Nielsen study had a strong focus on commercial aspects and the influence of social media on consumers' buying decisions, Morris et al. (2010) focus on the role of social networks for the general information seeking behavior of users. They analyze that

> "[…] social networking services provide a source of information that is complementary to that provided by search engines; the former provides information

> that is highly tailored to an individual and comes from a highly trusted source, while the latter provides objective data from a variety of sources on a variety of topics." (Ibid.: 1739)

This suggests that the social aspect of these sites can be a distinct motivational factor for using them, e.g., due to the authentic and diverse contributions from other participating users. For example, they take the usage behavior of the online encyclopedia *Wikipedia*, which is mainly used for looking up terms and reading articles rather than contributing content (cf. ibid.: 142). This observation is in line with the perspective of this thesis to further analyze the role of social software as a source in the information seeking behavior of young professionals in management consulting. Therefore, the content provided by these applications needs to be analyzed in further detail.

The definition of social software developed in section 2.1 indicates that this concept not only refers to the various types of applications but also to the information that results from the social interaction of its users. This refers to the resulting relationships between individuals on the one hand; and to the information exchanged between the social actors of the type of software described above on the other (e.g., in the form of profile information, preferences, listening or reading habits and any other information). Since these applications spotlight the users and only serve as a platform for their activities, the information provided by such services seems to be of a specific character. In contrast to traditional information sources such as books, electronic databases, scientific journals, editorial websites, or even subject matter experts, this type of information varies in its form as well as its creation process. The latter is expressed by the term 'user-generated content'. User-generated [or -created] content can be defined as "[…] content made publicly available over the Internet, which reflects a certain amount of creative effort, and which is created outside of professional routines and practices" (Wunsch-Vincent/Vickery 2007: 9). This definition is a very broad one, leaving questions regarding the degree of creative effort and its meaning unanswered, but it highlights the aspect of a new publication paradigm in times of 'produsage' (see section 2.1). The form of this type of content is characterized by the respective distribution platform, e.g., written comments being diffused on blogs or videos being diffused on online sharing platforms (cf. ibid.: 31). With the rise of social software applications, user-generated content has become a dominant carrier of information on the World Wide Web as well as closed environments (such as intranets). According to the OECD study cited

above, there are four different types of drivers of user-created content accounting for its rapid growth and pervasiveness:

- technological,
- economic,
- institutional/legal and
- social drivers

(cf. ibid.: 27 ff.).

From a technological perspective, increased broadband availability, hard drive capacity, processing speeds, as well as a decrease in hardware costs can be seen as catalysts for the distribution of user-generated content. This was accompanied by an increase in quality of consumer technology and a variety of new (mobile) devices for audio, photo and video content. But most importantly, the described social software applications themselves resemble a new kind of technology that makes creating, editing, distributing and sharing content easier. The relatively low costs of creating and hosting a social distribution platform represent low market entry barriers for stakeholders interested in monetizing user-generated content. Together with the growing user (and thus prospective customer) population and increased possibilities to raise capital for ventures in this domain, economic interests are another central driver for the rising distribution of this type of information source. The figures of registered users in the millions offer great opportunities for advertising. This is evident especially in combination with the amount of personal information provided by the users themselves (e.g., in online social networks), targeted advertising enters a whole new dimension and creates a variety of new business models. With rising economic interest, new legal means to create and distribute content have been developed. "Flexible licensing and copyright schemes such as the Creative Commons licenses allow easier distribution, copying and – depending on the choice of the author – the creation of derivative works of user-generated content" (Ibid.: 30). This reinvention of the copyright dogma helped to support the distribution of user-generated content without traditional legal and economic barriers.

However, apart from the technological feasibility, economic interests and institutional enablers, certain social predispositions had to exist in order to bring about the above described popularity of amateur content. One of these can be described as an increased acceptance of and willingness to convey personal information. This phenomenon of an unprecedented self-revelation is in many aspects a driver of the distribution of user-generated content and

the success of notion of social software in general. Furthermore, the desire to engage in social, political and educational activities and the interest in forming communities and interacting with other Internet users, exemplify the impact of social developments on the overall availability of user-generated content. Finally, a shift to younger age groups with substantial ICT skills is often mentioned in research and in public media as one of the characteristic elements of the social web. The early adopters of social software applications and the possibilities to publish self-made texts, pictures and videos were regarded by those users that have been exposed to digital technologies all their life. The lively participation of this demographic group is considered a central social driver for the rise of user-generated content, as indicated in section 1.1.

Returning to the perspective on user-generated content as a source of information, however, the following can be summarized based on the observations described above. The information provided by and created with social software blurs the lines between producers and consumers. This change of traditional roles in the information architecture brings about opportunities and challenges. One the one hand, data produced in non-professional routines is available at large and – to a certain degree – free of economic interest. On the other hand, it might lack the quality of professional services or even be misused. Regardless of the quantity and quality it is the hypothesis of this study, the information exchanged within social software applications is of a *social nature*. It is produced, corrected, shared, rated and recommended by users. These users contribute this content mostly in non-professional routines. Nevertheless, they oftentimes can be considered experts or at least aficionados in certain areas of interest. This '*social information*'[28] adds the dimensions of expertise, subjectivity and context to the data available. Internet portals like *Digg* or *Qype*, which are based on user-created recommendations and ratings for news or restaurants, reveal the full power of such information. Information created in professional routines would neither be able to reach the degree of coverage nor the extent of credibility. Altogether the rise of the web 2.0, social software and its user-generated content have developed a dynamic environment within the Internet itself and within all service providing corporations dependent on the information provided by the

28 Section 5.3.3 will go into further detail regarding the definition of 'social information' as a central concept of information seeking in such knowledge-intensive business services as management consulting.

World Wide Web. Furthermore, they start to adapt their internal electronic information environment by copying the social web principle within their corporate boundaries (see section 2.3.2). Social software therefore subsumes the entirety of emerging applications providing this type of information. Accordingly, the way employees – especially the young ones that are just entering the organization – make use of such information sources in the workplace environment needs to be thoroughly investigated and understood.

2.4 Summary

Summarizing the above described phenomena, two major developments can be observed:

- First of all, the rise of the participative web has changed today's digital information environment and attracted a lot of attention in the corporate environment as well as in related areas of research. Scholars of different disciplines have started to analyze the influence of social software on their disciplines and research interests. This led to a variety of new research fields and methodologies related to the scope and focus of this doctoral dissertation within information science. Furthermore, companies have developed first strategies on how to exclude the social web from the workplace or include it into the same and in some cases already developed internal social software applications, which aim at transferring the success and principle of the web 2.0 into corporate boundaries. Even though many aspects of the popularity and character of social software have been analyzed; and even though first pragmatic approaches for its inclusion in the workplace environment have been developed; a systematic understanding of the character of social software applications and their role as an information source yet needs to be gathered.
- Secondly, it can be stated that a variety of studies have drawn to the fact that today's young professionals have been exposed to communication and information technologies by birth, whether this may be called a generational phenomenon or not. It has been stated that growing up in an age where e-mail and the World Wide Web are well established elements of everyday life, has an impact on the way young adults approach and use emerging web technologies. In regards to the social web, studies have shown that young adolescents are at the forefront of technology adoption

and usage. Since this user group represents an upcoming workforce for today's companies, it is essential for employers to understand its common behaviors and attitudes in the interaction with this type of media in the workplace.

These observations lay the foundation for the research interest of this thesis. In order to be able to address the raised considerations appropriately, however, a thorough review of existing concepts and findings of prior research is required. As this chapter has revealed, the main focus thereby lies on the way individuals seek and use information in a specific context of use. Thus, central concepts and previous findings of information seeking research need to be reviewed.

3 Central concepts and previous findings of information seeking research

As it is the goal of this doctoral dissertation to analyze the role of social software as an information source in the workplace, a deep understanding of the work context of employees and their behavior is required. The present study therefore aims at modeling the information seeking behavior of young professionals in management consulting. This empirical and analytical approach builds upon an extensive inventory of methods and findings within information science. Chapter 3 will therefore provide an overview of central concepts and previous findings regarding the way individuals seek information in specific contexts. Section 3.1 presents an overview of the field of information needs, seeking and use (INSU) research in order to distinguish the perspective and methods employed by this thesis. It introduces the way theory is built in this field of research and defines the level of scope and perspective to the above described research interest. This leads to a definition of information need, types of information and task complexity as central concepts of task-based information seeking in section 1.1. In the following, section 1.1 provides an overview of previous studies on task-based information seeking in the workplace in general and an analysis of findings on the information seeking behavior of young professionals (see section 1.1) in specific. Furthermore, existing considerations of social software in INSU research will be reviewed in section 1.1. Finally, section 1.1 summarizes this review of relevant research literature, the identified critique as well as selected, open research questions and their implications for the interest and design of this study.

3.1 The field of information needs, seeking and use research

In order to understand the field of information needs, seeking and use research within information science and its relevance for the research interest of this thesis, the statement by Vakkari, Savolainen and Dervin in their fore-

word to the 'Information Seeking in Context' (ISIC) conference in Tampere 1996 as cited in the introduction above ought to be considered. Therein, they described this field of research to provide the theoretical foundation for understanding human information behavior, which is considered to enable the utilization of information in society in general and the meaningful design of information systems and environments in particular (cf. Vakkari et al. 1997: 7).

According to the initial description of information science (see section 1.1) one of its main characteristics today is the approach of human behavior and system interaction from a cognitive perspective. As the previous statement reveals, this is specifically expressed by the emergence of information needs, seeking and use studies that have become one of today's most vivid fields of LIS research (cf. Fisher et al. 2005) next to such core disciplines as human-computer interaction and information retrieval. INSU studies follow a rather holistic approach to analyzing the interaction of cognitive actors with different forms and sources of information in a variety of contexts. The special interest group 'USE' of the *American Society for Information Science & Technology* (ASIS&T) describes its academic members to be:

> "[…] concerned with the activities, both behavioral and cognitive, of people who are interacting with information. These activities include: recognizing information needs, seeking information that will address those needs, exploring information sources present in one's context/situation, retrieving information from available information sources, communicating and collaborating with others concerning an information need or information resources, using information, and other interactions between people and information." (ASIS&T 2011)

It is the goal of this field of research to build a rich collection of theory on behavioral patterns and model the context of the cognitive actor in order to enable adjoining disciplines to develop effective information systems and user-centered interface designs. The various approaches to building such theory and the different perspectives and levels of scope when modeling the earlier mentioned activities will be reflected in the following in order to present a classification of those theoretical models in INSU research that are most relevant to the research interest of the present doctoral dissertation.

3.1.1 Building theory in INSU research

First of all, the overall research culture of building theoretical and empirical theory in INSU research needs to be understood. In order to achieve the previously mentioned aim of scientific practice, a certain research strategy, methods of data collection and analysis and type of investigation are required (cf. Järvelin/Vakkari 1990). Since the field of INSU studies – with its holistic perspective on users and their context – is strongly interlinked with different research disciplines such as, the humanities and social sciences, all of these aspects of building theory are influenced by a multitude of interdisciplinary concepts and practices. As a result, the employed research strategies differ from traditional system-oriented approaches in information retrieval that mostly follow the constructive paradigm of developing information systems and evaluating their performance *a posteriori*. According to Ingwersen and Järvelin (2005) "[…] typical strategies for theoretical research may be called the conceptual research strategy (e.g., verbal argumentation, concept analysis), mathematical or logical strategy" (Ibid.: 86), which lay an argumentative foundation for any other research approach *a priori*. Next to such theoretical research the field of INSU is characterized by a large amount of empirical studies.

Table 4: Methods used in INSU studies

Method	1984–1989 (%)	1990–1994 (%)	1995–1998 (%)	Overall Mean (%)
Citation Analysis	2.5	3.7	1.4	2.5
Ethnography	1.9	3.7	2.1	2.6
Experiment	4.4	6.1	2.1	4.2
Interview	13.1	11.0	9.2	11.1
Questionnaire	48.8	43.6	48.6	47.0
Transaction Log Analysis	18.1	4.3	14.8	12.4
Mixture	7.5	18.4	15.5	13.8
Sample: articles indexed with "information needs" and/or "use studies" in the *Library Literature* index Periods: 1984–1989: n = 233 / 1990–1994: n = 241 / 1995–1998: n = 206				

(adapted from Julien/Duggan 2000: 306)

Empirical INSU research builds upon the developed theoretical foundations and employs different methods of data collection and analysis. Their most common goal is to gather a descriptive understanding of a certain user population, context of use or usage behavior. Therefore qualitative as well as

quantitative data collection methods such as questionnaires, interviews, observation, content analysis and historical source analysis are employed (cf. ibid.: 86 ff.). In their longitudinal analysis of the information needs and use literature of the 1980s and 1990s Julien and Duggan (2000) assessed the use of research methods in the field of information needs, seeking and use studies. The overview of results presented in table 4 reveals the large variety of methods in total on the one hand, but also documents the dominant use of questionnaires for the purposes of INSU research.

While traditional data collection methods of IR research (such as experiments and citation analysis) hardly played any role, over 60% of the analyzed INSU studies used interviews and questionnaires to gather data. In addition, new techniques such as log file analysis and ethnography have been employed to add an external perspective to such subjective descriptions. Particularly the latter reveals that information science has opened up to adjoining disciplines in order embrace the holistic cognitive perspective of information needs, seeking and use. Wilson (1999) states that:

> "[…] the general adoption of qualitative methods (from the early 1970s in the UK) [that it] has resulted in the work that is in the wider tradition of the investigation of human behaviour and which, therefore, is more likely to find theories and models in the social sciences that can be applied to the study of information behavior." (Ibid.: 250)

This is also expressed by the fact that many recent studies on information behavior (e.g., Freund/Toms 2005; Freund 2008; Fidel et al. 2004; Notess 2004; Makri 2008; Kim 2009) applied the socio-scientific '*grounded theory*'[29] approach coined by Glaser and Strauss (1967) or observation methods from organization and management studies such as 'structured observation' (Mintzberg 1970) and 'work shadowing' (Walker et al. 1956). As Glaser and Strauss (1967) have formulated, well-founded scientific knowledge excels by the combination of qualitative and quantitative methods:

---

29 The basic position of this qualitative research approach is that generating grounded theory is a way of arriving at theory suited to its supposed uses. It may therefore be contrasted with theory generated by logical deduction from *a priori* assumptions and describes a research practice where data collection, data analysis and theory development are not seen as distinct (cf. Glaser/Strauss 1967: 3). It rather means to repetitively describe observed phenomena in 'categories', 'codes', and 'codings' until new data does not change the emerging theory anymore.

> "In many instances, both forms of data are necessary – not quantitative used to test qualitative, but both used as supplements, as mutual verification and, most important for us, as different forms of data on the same subject, which, when compared, will each generate theory." (Ibid.: 18)

This summarizes the observation that INSU research differs from traditional system-oriented IR research and also indicates that the types of results are of a particular form.

As elaborated earlier, the main interest of INSU studies is to explore the context of a specific user group and model their information behavior with the purpose of understanding the role of specific types of information, information sources and deriving conclusions on the design of the information environment in general or a particular information system. The typically inductive research approach therein derives a conceptual model from qualitative observations of respective contexts and behavioral patterns in order to enable anticipating common activities of information seeking and usage of sources. The character of these theoretical frameworks and cognitive models depend upon the scope and perspective of the respective sub-domains of INSU research. This will be further discussed in the following so as to classify existing relevant findings for this thesis.

3.1.2 Differences in scope when modeling the user context

While it is the common interest of all INSU studies to widen the system-oriented perspective of IR research to include the cognitive actor by modeling his context and all activities involved in the interaction with information, they differ in scope with respect to the phenomena and activities they involve. Primarily, this applies to the question of whether a study focuses on the early stages of information need and seeking or on the analysis of usage behavior of sources and the interaction with the gathered information. Studies that mainly focus on the empirical analysis of media and information source usage are not at the heart of this field of research. Rather those studies that focus on different levels of information seeking behavior are most characteristic for INSU research. Now the scope of the research models in this field may vary to be either broad or narrow (cf. Ingwersen/Järvelin 2005: 15). Hence,

> "[…] some models cover[s] only computational and/or formal aspects of IR (i.e., the Laboratory Model of IR). Other models attempt to cover human aspects in varying scopes, some focusing on information retrieval interaction

> (e.g., the Mediator Model, Ingwersen 1992), some on information seeking (e.g., Ellis 1989), and some on the (work) context of IS&R (e.g., Paisley 1968). Some models attempt to encompass several domains like the work context and associated information seeking (Byström and Järvelin 1995)." (Ibid.)

According to Wilson (1999) the models in information behavior research may thus be seen as a series of nested fields (see figure 9).

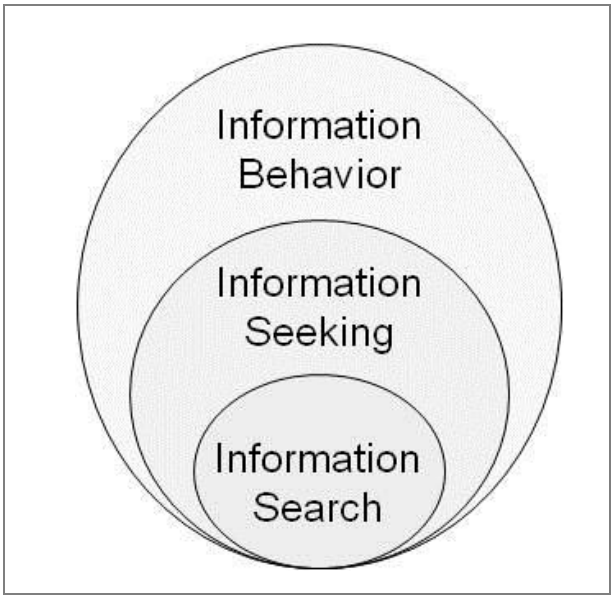


Figure 9 A nested model of INSU research areas (adapted from Wilson 1999: 263)

'***Information behavior***' as the more general field of investigation analyzes "[…] those activities a person may engage in when identifying their own needs for information, searching for such information in any way, and using or transferring that information" (Ibid.: 249). Wilson's (1981/1999) model of information behavior may be considered most broad and general[30] (Ingwersen/Järvelin 2005: 67) and may therefore serve quite well for the description of the general context and the main three elements involved in the workplace environment and scenarios of this study. His three-fold view of information seeking considers:

1. the context of the seeker,

30 See section 3.1.3 for further details regarding the classification of conceptual models in information seeking research according to Ingwersen and Järvelin 2005.

2. the systems employed (which might be manual or machine and navigated either personally or by an intermediary) and
3. the information resources that might be drawn upon.

However, it does not provide a detailed framework for the various activities and their chronological occurrence. As a sub-set of this field, '***information seeking behavior***' reduces the scope of interest to "[…] the purposive seeking for information as a consequence of a need to satisfy some goal. In the course of seeking, the individual may interact with manual information systems (such as a newspaper or a library), or with computer-based systems (such as the World Wide Web)" (Wilson 2000: 49).

Finally, the category of '***information search behavior***' describes "[…] the 'micro-level' of behaviour employed by the searcher interacting with information systems of all kinds" (Ibid.).

This classification of sub-domains in the field of information needs, seeking and use studies clarifies the differences in scope in between the respective areas of information seeking behavior as well as between ISB and IR research, which is concerned with the development and evaluation of information systems and their ability to retrieve relevant documents within a certain collection of information objects. All of these different levels of scope contribute to the understanding of how individuals interact with an information system or entire information environment in order to identify a specific information need, seek information and use or transfer that information in a certain context.

As introduced in chapter 1, the research interest of the present doctoral dissertation lies upon the way a certain user group seeks information in the workplace environment and the role social software may purposefully play as an information source for young professionals in management consulting. In this context the concept of task represents a central element for the research scope of this study. It is characteristic for the workplace environment and it serves an explanatory as well as empirical role (see section 3.2.2). This limits the scope to "[…] the purposive seeking for information as a consequence of a need to satisfy some goal" (Wilson 2000: 49). Thus, the field of information seeking research provides the most adequate level of scope for this thesis. Within this sub-domain there are, however, various differences in regards to the perspective on the subject.

3.1.3 Differences in perspective when modeling information seeking

Having identified the different levels of scope of INSU and the field of information seeking to be most relevant for the present research interest, one needs to further define the most adequate perspective on the object of research and review its most relevant findings. The research perspective is another distinctive feature of information seeking models. According to Ingwersen and Järvelin (2005), such models may be differentiated in addition to the level of scope described above based on the following dimensions:

- Applicability: general vs. specific
- Method: abstract vs. concrete
- Type: summary vs. analytical
- Structure: process vs. static

(cf. ibid.: 15)

The dimension of applicability describes the range of empirical domains a model claims validity for. The more general a model is considered to be, the more domains are described in it. This may apply to, e.g., a specific data format (such as text documents), a particular user group or language. Most of the information seeking models that share a broad scope, are typically considered to be general conceptual models. Another distinctive characteristic of these models is the method of data collection and the level of specificity of its results. Accordingly, conceptual models are considered rather abstract, if they "[..] focus on abstract phenomena, interpretations or structures related to the stakeholders, and the relationships of the former" (Ibid.). On the contrary, "concrete models (e.g., Allen 1969) focus on actual concrete stakeholders in an IS&R process, and their relationships" (Ingwersen/Järvelin 2005: 15). Models of information seeking furthermore differ by type, as some (e.g., Ingwersen 1996; Paisley 1968; Wilson 1997) summarize the central objects in an information seeking process and their relationship without further classifying and analyzing either, while other focus on analyzing the interplay of these objects in order to generate testable hypotheses (e.g., Byström/Järvelin 1995). The most distinguishing dimension is that of the model structure. While process models aim at describing an individual's information seeking activities as a certain set of sequential steps, static models focus on identifying features of information seeking and explaining the involved activities as well as relevant sources of information (cf. Ingwersen/Järvelin 2005: 15).

These dimensions of perspective best illustrate the differences regarding the structure, type, method and applicability of information seeking models and help to classify existing research findings. In the following, central concepts of information seeking behavior and models that are relevant to the interest and perspective of this thesis shall be presented in order to provide a brief overview of previous research.

3.2 Central concepts of task-based information seeking

As the introduction to the field of information needs, seeking and use has shown, the central focus of this type of research is the context of the individual (also referred to as '*cognitive actor*') and certain behavioral patterns in the interaction with the information environment. In order to describe the different objects and factors that are relevant to this context, several theoretical concepts have been developed and established in INSU literature. Those concepts have constituted the research perspective of this study and will be defined in the following.

3.2.1 Information need

The starting point for any research on task-based information seeking is the realization of an information need. Specifically for any directed and active form of information seeking, a conscious gap in knowledge or a lack of understanding is widely seen as motivation of an individual to become active. The cognitive perspective considers this primarily to be an internal and subjective state. This goes back to Taylor's (1968) conclusion that information need may be categorized along four levels of question formation:

- the '*visceral need*': an actual, but unexpressed need for information;
- the '*conscious need*': an conscious, within-brain description of the need;
- the '*formalized need*': a formal statement of the need;
- the '*compromised need*': the question as presented to the information sys tem

(cf. ibid.: 127).

> "Taylor's work laid the foundation for a deeper conceptual understanding of the motivations or triggers for information seeking. It was the basis for subsequent insights by researchers such as Belkin, Saracevic, Ingwersen, Dervin and Kuhlthau." (Bruce 2005)

Belkin, for example, built upon this cognitive perspective on information need and coined the concept of the '*anomalous state of knowledge*' (ASK) (i.a., Belkin et al. 1982). "The ASK hypothesis is that an information need arises from recognized anomaly in the user's state of knowledge concerning some topic or situation and that, in general, the user is unable to specify precisely what is needed to resolve that anomaly" (Ibid.: 62). This concept has been established and extended over the years and plays an important role, specifically in information retrieval research. There, anticipating the so far unexpressed information need has become a central matter of interest (e.g., Bruce 2005).

Regarding the field of information seeking research, however, the uncertainty principle developed by Kuhlthau (1993b) has influenced many studies. This is defined as "[…] a cognitive state which commonly causes affective symptoms of anxiety and lack of confidence" (Ibid.: 347). It furthermore causes a 'process corollary', i.e., a process of information seeking that aims at pursuing understanding and meaning from the information encountered over a period of time (cf. Ibid.).

The central notion of these definitions is that of a non-existent objective information need and the challenge of designing information environments so they account for the user's difficulty in expressing his subjective information need. They also express the common perception, however, that either uncertainty, an anomalous state of knowledge or a conscious need of information mark the starting point of an information seeking process.

3.2.2 The concept of task

In most situations, and most specifically in the workplace context, an information need is evoked by a certain task. The concept of task has been widely considered in INSU research (e.g., Byström 1999, Byström/Järvelin 1995, Bell/Ruthven 2004, Vakkari 1999/2003, Campbell 1988, Li/Belkin 2008, Xie 2009, Liu et al.2010) and is central to the field of information seeking in a two-fold manner. On the one hand, it allows the analysis of reasons for and influence factors of the process of information seeking in general. On the other hand, it serves as empirical unit of measure for a series of directed ac-

tivities of information seeking in a specific problem-solving context. Byström and Järvelin (1995) summarized the INSU research perspective on the concept of task as follows:

> "In the context of information seeking, we are interested in information-related tasks. These can be seen as perceived (or subjective) tasks or objective tasks. [..] However, in this study perceived tasks must be considered because each worker may interpret the same objective task differently (e.g., as regards its complexity), and the perceived task always forms the basis for interpreting information needs and the choice of promising actions for satisfying them." (Ingwersen/Järvelin 1995: 193)

Work task – search task – retrieval task

Accordingly, it can be distinguished between different types of task and the distinctive levels of task. Corresponding with the previously described levels of scope in INSU research, tasks may also be categorized as work tasks, seeking tasks and retrieval tasks. The most granular level is described by '*retrieval tasks*', which are considered to be the various interactions with an information system, an individual engages in during an '*information seeking task*'. While '*work tasks*' are commonly understood on a more general level as separable parts of one's duties to an employer, information seeking tasks are seen as subtasks of work tasks that describe all the actions taken to gather information required to satisfy an information need. Work tasks may not be explicitly defined, but are always to some degree outlined by the work organization. That is why the norms and values of the social context of the work organization as well as the individual's work role guide the performer's behavior (cf. Byström/Hansen 2005: 1053). Information seeking in such a context is seen as a central part of information intensive work tasks and may be divided into stages such as task construction, task performance and task completion (cf. Byström 1999: 36).

> "Hansen (1999) points out that there are differences in the procedures to initiate work tasks; sometimes there may be highly predefined task procedures, and in other cases a task may be initiated as a mere notion of what is wanted or needed within a specific situation. Task construction consists of the analysis of the information that is needed. Task performance is comparable to actual information seeking, that is, the actions taken to gather information. Task completion for information seeking tasks may be described as the evaluation of the results of information seeking." (Byström/Hansen 2005: 1055)

This process perspective on task performance is one of the central branches of INSU research and will be further described in section 3.3.2.

Types of work tasks

Across the different levels of task, the degree of complexity is the most characteristically distinctive feature that has given rise to various typologies of tasks. One of the most influential task categorization for information seeking behavior research was introduced by Byström and Järvelin (1995) in their analysis of the effects of task complexity on information seeking behavior. Therein they defined task complexity as the degree of *a priori* determinability (or structuredness) of the task outcome, the required process and the information required to solve the task (see figure 10).

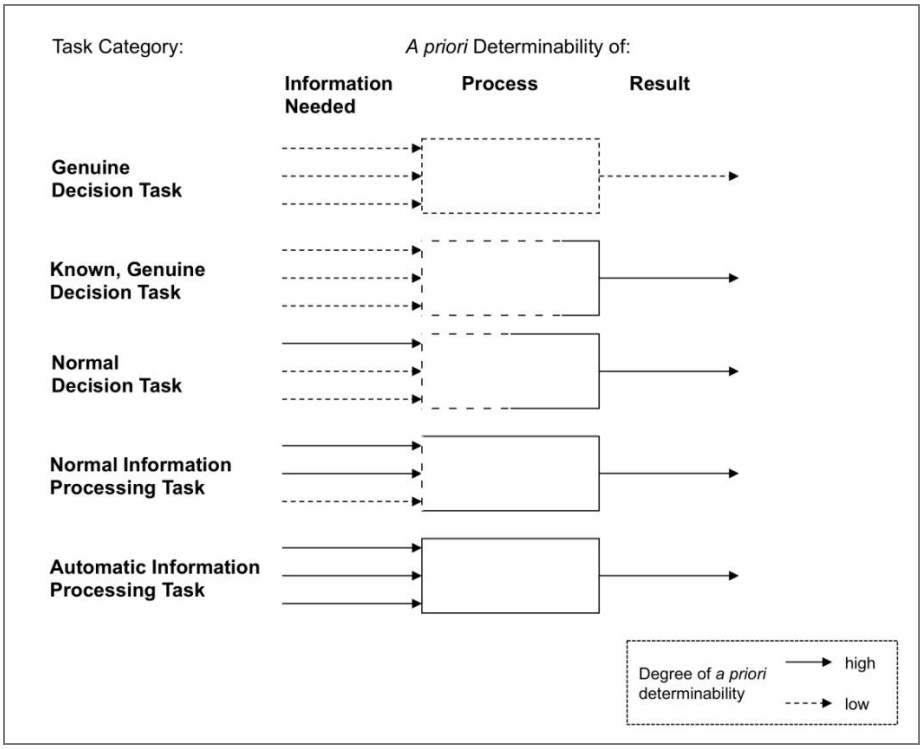


Figure 10 Work task categorization (adapted from Byström/Järvelin 1995: 195)

This led to the following classification of different types of tasks:

"*Automatic information processing tasks* are a priori completely determinable so that, in principle, they could be automated – whether actually automated or not.

Normal information processing tasks are almost completely a priori determinable, but require some case-based arbitration concerning, for instance, the suf-

> ficiency of information normally collected. Thus, part of the process and the information is a priori indeterminable.
>
> *Normal decision tasks* are still quite structured, but in them case-based arbitration has a major role.
>
> In *known, genuine decision tasks* the type and structure of the result is a priori known, but permanent procedures for performing the tasks have not emerged yet. Thus, the process is largely indeterminable and so are its information requirements.
>
> *Genuine decision tasks* are unexpected, new, and unstructured. Thus, neither the result, the process, nor the information requirements can be characterized in advance. The first concern is task structuring." (Ibid.: 194 ff.)

Whether this categorization is suitable for the context of management consulting with regards to the level of granularity and terminology will be evaluated in the exploratory study of this doctoral dissertation (see section 5.3.2). Nevertheless, this typology of information intensive work tasks points to the fact that various context factors influence the way information is sought, they type of information is needed and the sources an individual consults. The analysis of such factors of information seeking represents the other central branch in INSU research and will be further discussed in section 3.3.1.

Overall, the relevance of the concept of task and its different types for information seeking research may best be highlighted by the following statement by Liu et al. (2010):

> "We are concerned in our research with being able to predict task type based on searcher behavior in the course of an information seeking episode. The rationale for this focus is this: if task type can be predicted from implicit evidence, then that knowledge can be used to interpret implicit indicators of usefulness, relevance, etc., in order to make personalization of the search experience more accurate and useful." (Liu et al. 2010: 69)

While this largely expresses the micro-perspective of IR system design, the overall meaning and benefit of identifying different types of task based on their level of complexity is also valid for the wider scope of information seeking. Especially in the workplace domain this may be realized by adapting the overall information environment by characterizing patterns of information use and the factors affecting use in particular work situations. In her analysis of human-work domain interaction and its implications for the design of a corporate digital library, for example, Xie (2006) found that the majority of the tasks people performed in the analyzed corporate setting were typical and routine. As a result, it was possible to identify the most important user support needs in corporate digital library usage and draw the corre-

sponding design recommendations (cf. ibid.: 140 ff.). As indicated before, the context of management consulting is not considered to contain many routine activities, the research perspective and the relevance of the concept of task for studies on task-based information seeking behavior in the workplace, however, are well exemplified by such studies. Accordingly, an essential prerequisite for analyzing the role of social software as an information source in the workplace of young professionals will be an investigation of the most common types of task in the analyzed work context.

3.2.3 Types of information

The various types of information intensive work tasks with differing degrees of complexity not only indicate that the amount of required information varies but also that the type of needed information itself may be distinguished. Information about the task itself, e.g., the scope, deadline, as-is and to-be status, is different in nature from information that is more fact-oriented and independent of a specific task, e.g., census statistics, mathematical formulas, industry standards. Just like the information need (see section 3.2.1), the information itself is a subjective concept. Thus, the functional view on types of information was found to be a valuable distinction in INSU research for the description of information seeking behavior and drawing conclusions for the design of information systems or environments (i.a., Barr/Feigenbaum 1981; Järvelin/Repo 1983, 1984; Järvelin 1987; Byström/Järvelin 1995; Byström 1999). The following types of information[31] have most prominently been perceived in INSU research and were exemplified by Byström/Järvelin (1995) by means of the metaphor of a bridge construction:

> "*Problem information* describes the structure, properties, and requirements of the problem at hand. For example, in bridge construction, information on the type and purpose of the bridge and on the site where it must be built constitute [sic!] problem information. It is typically available in the problem environment – but in the case of old problems it may also be available in documents.

31 The term 'problem' often is exchanged for 'task', so that other publications refer to 'task information' and 'task-solving information' (i.a., Byström 1999).

> *Domain information*[32] consists of known facts, concepts, laws, and theories in the domain of the problem. For example, in bridge construction, the strength and thermal expansion of steel constructs belongs to domain information. This is typically tested scientific and technological information published in journal articles and textbooks.
>
> *Problem-solving information* covers the methods of problem treatment. It describes how problems should be seen and formulated, and what problem and domain information should be used (and how) in order to solve the problems. For example, in bridge construction, the design engineer's heuristics concerning the pros and cons of various bridge design types constitute problem-solving information. It is instrumental information, and typically available only from knowledgeable persons (or experts). These three information categories are orthogonal (i.e., represent three different dimensions and have different roles in problem treatment). All are necessary in problem treatment but, depending on the task, may be to different degrees available to a worker performing the task. Because their typical sources are different, typical channels for acquiring them may also be different." (Ibid.: 195 ff.)

The definitions and particularly the metaphor of bridge construction provide a good understanding of the differences in information types from the perspective of task performance. As the final statement indicates, these types of information may be found in differing sources of information. That is why this concept is of central relevance to the research interest of the present study. It needs to be understood what types of information are required in a particular work context and from which type of information sources they may be retrieved in order to come to an understanding of the role of social software as an information source in the workplace environment.

3.2.4 Information environment

This leads to the consideration of different sources and channels of information available to the individual in the workplace. As highlighted earlier, the scope of information seeking research includes more than one specific information (retrieval) system. "For understanding information seeking by human actors, the proper system is not some service (e.g., a library) and its

32 In the course of this dissertation the term 'domain information' shall be replaced by 'factual information' in order to avoid irritations with different connotations from the field of IR research.

clients but rather an information actor immersed in his/her situation and information
environment (e.g., all information access systems)" (Ingwersen/Järvelin 2005: 13). The individual (or – in our case – employee) makes use of this environment to access information through various channels (e.g., colleagues, phone catalogues, internet search engines) from various sources (e.g., colleagues, manuals, internal memoranda). The line between channel and source of information may not always be drawn clearly (as, for example, colleagues may be considered to function as a channel to relevant information sources but just as well provide relevant information themselves), but most commonly "[…] from the worker's point of view, a source contains (or is expected to contain) relevant information, whereas a channel guides (or is expected to guide) the worker to pertinent sources" (Byström/Järvelin 1995: 193). Accordingly, the focus lies on the sources of information available to a cognitive actor in a specific context. This information environment may include electronic information systems just as well as rather traditional sources, such as, e.g., books, trainings and most importantly personal contacts.

Cool and Xie (2000), for example, categorized the information environment in a corporate engineering setting to contain:

- electronic resources (i.a., computerized library catalogs, web browsers, e-mail, groupware),
- electronic access systems (external computerized database systems, in-house computerized database systems)
- human information resources (i.a., information specialists/librarians, people on project team, people in work group, people outside of the company),
- and other information sources (i.a., books, manuals, technical memos)

While this exact classification does not claim validity outside of the specific context of a corporate engineering environment, it reveals the authors wide scope of diverse types of information sources. Their analysis of the accessibility, frequency of use and satisfaction with these elements of the corporate engineering information environment revealed that "[…] people make different uses of information and communication resources, regardless of their accessibility" (Ibid.: 484). Furthermore, their study showed a strong importance of colleagues and work group members as information providers. This was also supported by Hertzum and Pejtersen (2000) who observed that:

> "Engineers search for documents to find people, search for people to get documents, and interact socially to get both oral and written information without en-

> gaging in explicit searches. They do so to obtain information in effective ways but still find that the major obstacle to seeking both oral and written information is the cost/time involved in getting it. Further, oral information lacks permanence while written information, such as design documentation, seems to give an incomplete account of the context surrounding the specific issues treated in the documents." (Ibid.: 776)

Such holistic analyses of the information environment enabled the identification of multidimensional patterns of information behavior and thus a better understanding of each single source of information and the interplay of all of the available sources.

While the concept of an '*information environment*' as central object of investigation of information seeking research may appear to be rather vague and broad, it is considered an essential expression of its holistic and cognitive research approach. An isolated view on one information (retrieval) system and the way users interact with it may be suitable for evaluating the usability of its user interface (HCI) or the performance of its retrieval performance (IR). The full deliberation of possible points of reference in an individual's context, however, allows for the thorough analysis of the role of a specific source of information and serves as prerequisite for any form of system design. As a result, the present study shall take the full diversity of information sources in the workplace environment into consideration in order to come to a holistic understanding of the role of social software as one source of information amongst many and derive recommendations on how to integrate it into the existing information environment effectively.

3.3 Previous research on task-based information seeking in the workplace

As the introduction of the field of INSU and its central concepts above has shown, there is a considerable amount of research within information science regarding the way individuals seek information in a given information environment in order to satisfy an information need, i.e., reduce uncertainty when being confronted with a new problem or task at hand. Task-based information seeking research may be further characterized in terms of the subject group and context it considers on the one hand, and its scientific perspective or structure of conceptual models on the other hand.

In the course of this research, a variety of user groups have been studied. In their longitudinal analysis Julien and Duggan (2000) also presented an overview of the distribution of subject groups within INSU studies in the 1980s and 1990s (see table 5). It reveals that the most surveyed context was that of scholars and students with an average of 38% of the analyzed studies – an observation common to many fields of research. Most importantly, however, it highlights the low coverage of the workplace environment in this field of information science. This may be due to the fact that the cognitive approach of information seeking research arose from the traditional field of library science. Since such professional information services play only a little role in most workplace environments, employees in industrial work contexts have not been considered in many of the early theoretical models of information seeking. It may also, however, be explained by the common assumption of a transferability of findings from scholarly information and communication processes to the workplace and the natural difficulty of retaining access to observe and study employees in specific work task assignments.

Table 5: Subject groups studied in INSU research

Group	1984–1989 (%)	1990–1994 (%)	1995–1998 (%)	Overall Mean (%)
Employees	1.5	1.7	.6	1.3
General Public	12.3	7.9	15.0	11.7
Professionals	14.9	8.7	16.2	13.3
Scholars	13.8	22.4	19.2	18.5
Specific Group (other)	9.2	10.4	14.4	11.3
Students	22.1	19.1	17.4	19.5
More than One	5.6	*	4.2	4.9
Unspecified	20.5	29.9	13.2	21.2

Sample: articles indexed with "information needs" and/or "use studies" in the *Library Literature* index
Periods: 1984–1989: n = 233 / 1990–1994: n = 241 / 1995–1998: n = 206
* For this period, "more than one" and "unspecified" were merged into one category

(adapted from Julien/Duggan 2000: 307)

The results of the above mentioned longitudinal analysis of literature suggest accordingly "[…] that research in information behavior continues to focus on academic groups" (Ibid.: 306). Julien and Duggan further comment

on this observation that "it is unknown whether the information behavior of these groups remains popular for theoretical reasons, or whether they are studied for reasons of convenience, since they tend to be available to researchers" (Ibid.). Still, there is a variety of studies (e.g., Ellis 1993; Case 1991; Leckie et al. 1996; Choo 1993; Johnson 2004) that considered specific groups of employees and workplace contexts. As mentioned in section 1.1, previous research on information seeking behavior and the use of specific sources of information has considered quite a wide range of workplace contexts, such as those of engineers (Cool/Xie 2000; Du Preez 2008; Ellis/Haugan 1997; Fidel/Green 2004; Hertzum/Pejtersen 2000), physicians (Gorman 1995; Leckie et al. 1996), lawyers (Kuhlthau/Tama 2001; Leckie et. al 1996; Makri 2008; Wilkinson 2001) or social workers and public-service employees (Byström/Järvelin 1995; Byström 2002/1999). This shows that the workplace environment is increasingly relevant to INSU studies. On the one hand, most workplaces and industries today are heavily dependent upon so-called '*knowledge work*' and therefore require a holistic understanding of the way employees seek information in order to come to conclusions regarding the design of the workplace information environment. On the other hand, the context of employees in their every day work provides a multifaceted environment of different influence factors, such as situational context, organizational context, infrastructure, or individual competencies, which may serve as practical sphere for testing and refining theoretical considerations.

As indicated before, the subject group is only one aspect of characterizing existing research on task-based information seeking. Another distinction can be made based on the perspective of research and the structure of conceptual models resulting from it. As described in section 3.1.3 this dimension is part of a classification of research models proposed by Ingwersen/Järvelin (2005). It refers to the question whether research aims at recognizing and modeling behavioral patterns in a sequential order so that information seeking behavior, relevance of sources and documents, or requirements for interface design may be anticipated in advance or whether it intends to prepare the ground for any system-oriented research by analyzing the interrelation of various contextual factors and their influence on the information seeking behavior of specific user groups. As mentioned above, these two perspectives may be distinguished according to Ingwersen and Järvelin's classification into analytical/static and summary/process models. In the following, this distinction will be illustrated by reviewing analytical (see section 3.3.1) and process

models (see section 3.3.2) of task-based information seeking relevant to the research interest of this doctoral dissertation.

3.3.1 Relevant analytical models of task-based information seeking

The emergence of the cognitive approach of INSU studies to capture aspects of human behavior in the interaction with information objects and analyze the interplay of these defined central concepts of information seeking has its origin in the development of conceptual analytical models of information seeking. Such analytical models are often narrower in scope than the more general models of information behavior and are usually not aiming at explicitly modeling an IS&R process as a sequence of activities. However, a process may be understood to underlie the objects represented. They seek to classify the elements of a certain context and their relationships in order to generate testable hypotheses (cf. Ingwersen/Järvelin 2005: 15). It focuses rather on the whys and wherefores than the exact description of certain behavioral patterns. As a result, the different influence factors of information seeking behavior may be identified and reconsidered in further analyses of information source usage or the design of information (retrieval) systems or environments.

Wilson (1997), for example, developed an interdisciplinary model of information behavior in order to explain the activating mechanisms, intervening variables and factors that cause an individual to react to a perceived information need in a specific context by engaging in different activities of information seeking, processing and use. While this type of scope represents a rather abstract level of social science, the field of task-based information seeking has put forth a variety of analytical and static models that describe the workplace context and relevant influence factors of information seeking and will provide a sound basis for this study. In the following section, some of the most acknowledged conceptual models of task-based information seeking in the workplace will be presented and reviewed in regards to their relevance for the research interest of this doctoral dissertation.

Modeling the information seeking of professionals (Leckie et. al. 1996)

Regarding the workplace environment, the analytical perspective is well suited for describing the different elements of an individual's context of seeking and using specific information sources. This may be revealed best with the help of the work by Leckie et al. (1996). Based on the analysis and interpre-

tation of empirical studies on the information habits and practices of engineers, health care professionals and lawyers, they developed a model of information seeking that claims applicability to all professionals in the workplace (cf. ibid.: 160). In their analytical perspective they come to the supposition that

> "[…] the roles and related tasks undertaken by professionals in the course of daily practice prompt particular information needs, which in turn give rise to an information seeking process. However, information seeking is greatly influenced by a number of interacting variables, which can ultimately affect the outcome. Furthermore, any of the components of the model can occur simultaneously, thus representing the true complexity of a professional's work life." (Ibid.: 180)

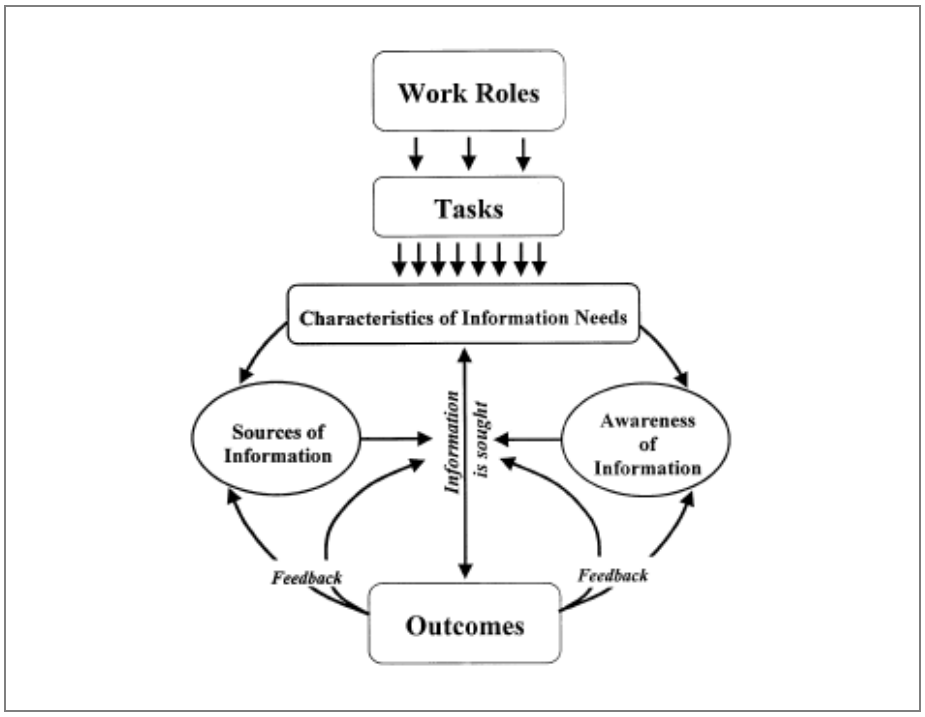


Figure 11
A model of the information seeking of professionals (Leckie et al. 1996: 180)

In their original model of the information seeking of professionals Leckie et al. therefore described the interplay of work roles, tasks, characteristics of information needs, sources of information, awareness of information and outcomes of the information seeking activities (see figure 11). It offers a very

broad overview of the central elements in the context of workplace information seeking and distinguishes certain significant themes. It is concluded that the information need is heavily influenced by the role-task-relationship and the work environment. Accordingly, the information seeking behavior of professionals is "[…] highly related to the enactment of a particular role and its associated tasks" (Ibid.: 181). Thus, the broader working conditions need to be examined closely when contextualizing the information behavior of individuals.

These include a company's corporate culture, the availability of information systems and sources and the commitment to professional development. Predictability of tasks, degree of urgency, task complexity and individual demographics are other factors identified by the authors of this model (cf. Alwis et al. 2006: 370). This is specifically related to the perception and formulation of an information need. It was stated that "[…] the nature of the specific profession, and factors such as age, career stage, area of specialization, and geographic location, can influence the formulation of the information need" (Leckie et al. 1996: 183). The model furthermore offered the explanation that "[…] the level of complexity, the degree of importance and urgency, and whether the information need is anticipated or unexpected together will affect the information-seeking activity undertaken" (Ibid.). Leckie et al. then argued that in the course of such activities the awareness of information and available sources can determine the path that information seeking would take.

> "Based on a review of the literature, some of the most important variables in this regard were found to be (in random order) familiarity and prior success (results obtained from strategy or source), trustworthiness (how reliable or helpful), packaging (convenience, usefulness, and others), timeliness (found when needed), cost (relative cost-effectiveness), quality (level of detail, accuracy, and so on), and accessibility (relative ease of access)." (Ibid.: 185)

Altogether, this model and the according considerations highlight the general perspective of analytical models by stressing "[…] that the conceptualization of why and how a professional seeks information cannot be reduced to a simplistic analysis of sources alone but, rather, involves a greater understanding of the various roles a professional performs and the associated tasks that prompt a need for information" (Ibid.: 187 ff.).

Relevance for the research interest of this study and criticism

With its focus on the role-task-relationship this described model of information seeking of professionals is of major significance for the context of management consulting. Since the work in this domain is characterized by ever-changing project assignments, work roles and tasks the identified interaction of these elements need to be taken into consideration in regards to the information seeking behavior and source usage of young professionals. Especially the characteristics of information sources named by Leckie et al. (1996) (familiarity and prior success, trustworthiness, packaging, timeliness, cost, quality and accessibility) furthermore provide a guiding framework for assessing the potential of social software applications as information sources in the workplace. The model does not, however, go into further detail regarding the different activities people engage in when seeking information. As it is characteristic for analytical models, Leckie et al. thoroughly identify contextual elements that influence information seeking but do not go into detail in regards to a common behavioral pattern itself. Thus, this model may well guide the further considerations and development of the methodical approach of this thesis, but it does not provide any conclusions as to when and for which purpose social software may serve as an information source in the workplace of young professionals.

The interplay of task complexity, information types and information sources (Byström/Järvelin 1995; Byström 1999)

As briefly discussed earlier, the concept of task, which is central to the consideration of information seeking behavior in the workplace, is most importantly characterized by its complexity. The different types of task introduced in section 3.2.2 thus represent different levels of *a priori* determinability, i.e., structuredness of a task's information need, process and expected result. Furthermore, it has been shown that information may also be distinguished in regards to its type (see section 3.2.3). In the course of their analysis Byström and Järvelin (1995) have developed an analytical model that describes the interplay of these central concepts and how task complexity affects information seeking and use. Based on a qualitative investigation in a public administration setting the relationship of task complexity, necessary information types, information channels and sources were analyzed at the task level. The findings indicated systematic and logical relationships among task complexity, types of information, information channels and sources. This may be reconstructed by the way incidents of information seeking were abstracted in form of a work chart structure (see figure 12) (cf. ibid.: 191).

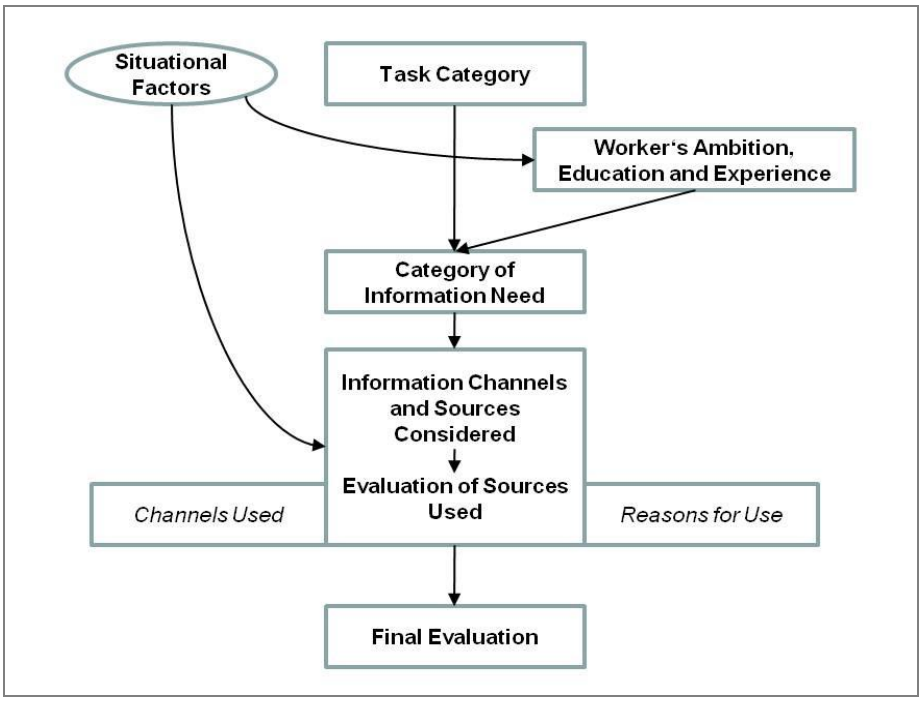


Figure 12 The work chart structure (adapted from Byström/Järvelin 1995: 200)

It reveals the assumed influence a task category has on the type of information need and in turn the way the information type influences the consideration of information channels and sources and how they are evaluated by the individual. Furthermore, the chart shows that situational (e.g., available time) as well as personal (e.g., ambition, education and experience) and organizational factors (e.g., work role, position) affect the interpretation of information needs and finally the way information is sought. The dominant distinctive element of the context of task-based information seeking according to Byström and Järvelin (1995), however, is task complexity. They concluded that "[…] as task complexity increases, so

- the complexity of information needed increases,
- the needs for domain information and problem-solving information increase,
- the share of general-purpose sources increases and that of problem and fact-oriented sources decreases,
- the success of information seeking decreases,

- the internality of channels decreases, and
- the number of sources increases"

(Ibid.: 211).

In addition to these first considerations, Byström (1999) further studied the effects of perceived task complexity on the relationship between information types and information sources. Based on fairly extensive empirical data in the workplace environment eleven statements were presented that offered standpoints on information seeking activities in task performance processes. From this analytical perspective the following conclusions were derived amongst others: "The higher the degree of task complexity, the more information types are needed, and the greater the share of people as sources and the smaller the share of documentary sources" (Ibid.: 122). Apart from the realization of the described relationships and influences of the analyzed concepts on task-based information seeking, these findings illustrate the type of results that may be derived from analytical models with the aim to classify the elements of a certain context and their relationships in order to generate testable hypotheses.

Relevance for the research interest of this study and criticism

The awareness of the interplay of task complexity, information types and information sources is an essential prerequisite for being able to evaluate the role of social software as an information source in the workplace of young professionals. The above described analytical considerations indicate that there will be no universal answer to the question whether to promote the inclusion of social software applications in the information environment of management consultants or not. It rather highlights the need for a multi-faceted analysis of specific use cases and situations where these types of applications may offer an informative value-add to the existing information environment and the respective definition of approaches on how to adapt the information environment accordingly. Hence, the developed types of information as well as types of tasks will need to be considered in the further design of this study. Since the presented explanatory framework, however, does neither provide insights into the different activities of information seeking nor clues about their sequential order, this model may not serve as guiding theoretical foundation for the research interest of this doctoral dissertation on its own. Furthermore, it needs to be evaluated whether the findings derived from a context of public administration work may be transferred to other

work domains. As a result, some of the concepts may need to be refined or extended.

Dimensions and factors influencing information source preferences (Alwis et al. 2006)

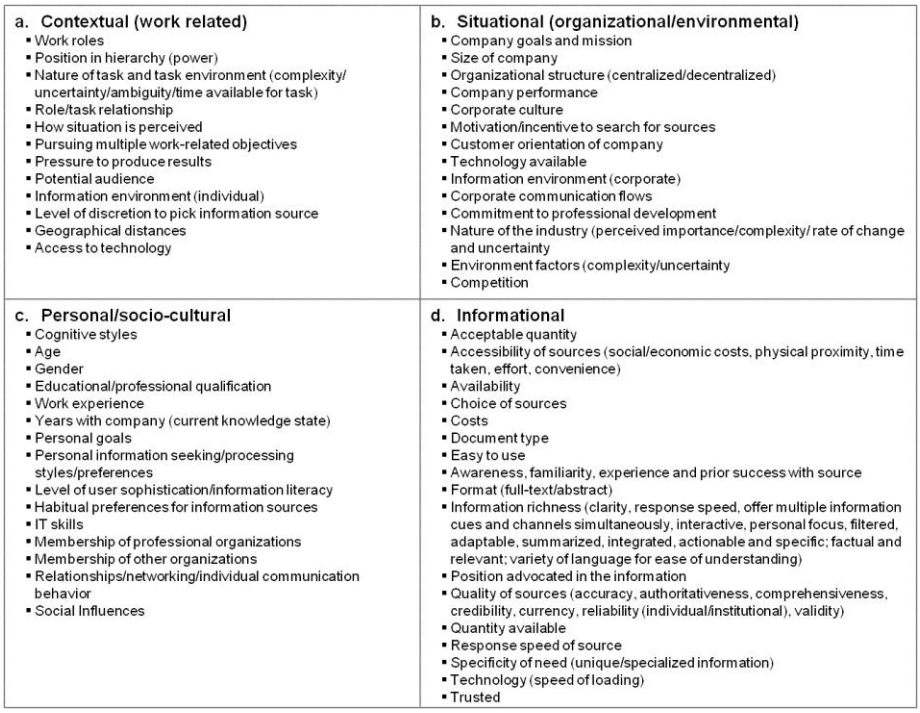
While the above presented analytical models focus on a variety of contextual elements and their interplay, Alwis et al. (2006) specifically focused on the dimensions and factors influencing the choice of information sources. Based on an extensive literature review they examined the transformation in managers' information seeking behavior. This refers to persons in charge of a formal organization or its subunits and their behavioral approach to seeking and handling information at work. They described the nature of managers' work to be characterized by high workloads, diverse and complex tasks, fragmented work, time constraints and the need to choose between alternatives based on cost, benefits and outcomes (cf. ibid.: 363). This highlights the importance of seeking and processing information successfully in order to be able to solve complex tasks and come to decisions required to fulfill their managerial role.

> "Regardless of whether it is a personal, documentary, or electronic information source, each information source displays characteristics that make it appropriate for some situations and not others and as a result today, the selection of appropriate information sources is a critical issue that managers are required to handle in the course of their work." (Ibid.: 366)

The selection criteria managers commonly apply have been analyzed by Alwis et al. to range from "user's perceptions and attitudes toward the characteristics of the information sources to criteria that may be economic, social, physical, psychological and technological" (Ibid.). As a result, the main dimensions and factors influencing information source preferences were categorized to be:

- contextual (work related)
- situational (organization/environmental)
- personal/socio-cultural
- informational.

These factors were arranged in a four-framed figure (see figure 13) to provide a complete overview of the key dimensions and the phenomena that may influence managers' preference for information sources.



a. Contextual (work related)
- Work roles
- Position in hierarchy (power)
- Nature of task and task environment (complexity/ uncertainty/ambiguity/time available for task)
- Role/task relationship
- How situation is perceived
- Pursuing multiple work-related objectives
- Pressure to produce results
- Potential audience
- Information environment (individual)
- Level of discretion to pick information source
- Geographical distances
- Access to technology

b. Situational (organizational/environmental)
- Company goals and mission
- Size of company
- Organizational structure (centralized/decentralized)
- Company performance
- Corporate culture
- Motivation/incentive to search for sources
- Customer orientation of company
- Technology available
- Information environment (corporate)
- Corporate communication flows
- Commitment to professional development
- Nature of the industry (perceived importance/complexity/ rate of change and uncertainty
- Environment factors (complexity/uncertainty
- Competition

c. Personal/socio-cultural
- Cognitive styles
- Age
- Gender
- Educational/professional qualification
- Work experience
- Years with company (current knowledge state)
- Personal goals
- Personal information seeking/processing styles/preferences
- Level of user sophistication/information literacy
- Habitual preferences for information sources
- IT skills
- Membership of professional organizations
- Membership of other organizations
- Relationships/networking/individual communication behavior
- Social Influences

d. Informational
- Acceptable quantity
- Accessibility of sources (social/economic costs, physical proximity, time taken, effort, convenience)
- Availability
- Choice of sources
- Costs
- Document type
- Easy to use
- Awareness, familiarity, experience and prior success with source
- Format (full-text/abstract)
- Information richness (clarity, response speed, offer multiple information cues and channels simultaneously, interactive, personal focus, filtered, adaptable, summarized, integrated, actionable and specific; factual and relevant; variety of language for ease of understanding)
- Position advocated in the information
- Quality of sources (accuracy, authoritativeness, comprehensiveness, credibility, currency, reliability (individual/institutional), validity)
- Quantity available
- Response speed of source
- Specificity of need (unique/specialized information)
- Technology (speed of loading)
- Trusted

Figure 13 Overview of dimensions and factors influencing information source preferences (adapted from Alwis et al. 2006: 373)

This review of literature and analysis of influence factors on source preference added a specific perspective to the collection of analytical information seeking models that allowed for conclusions on a high level of detail. As such, it is summarized, e.g., that "studies conducted over the years reveal that managers place very heavy reliance on people as sources of information" (Ibid.: 362). In regards to internet sites and web applications as sources of information it was referred to Hirsh (2000) amongst others who suggest it:

> "[…] reveals that, though work may require individuals to interact intensively with information, less than half the respondents used the WWW to find information relating to their work, and when used it is not to share information relating to the status of their current projects but to disseminate information about completed projects." (Ibid.: 365)

While there are a variety of studies reporting such findings on information source usage (see for example also section 2.2.2), the developed analytical matrix by Alwis et al. (2006) provides a comprehensive overview of dimensions and factors influencing information source preferences. They conclu-

ded, however, that there is a gap in INSU research regarding the analysis of information source preferences in the workplace environment, specifically in regards to the ever-changing information environment of the Internet and emerging web applications.

> "More in-depth studies on this aspect would be useful for information providers and professionals as it would enable them to customize products and services more effectively for the users; and would have a spill-over effect on managers who would be able to acquire information efficiently and skillfully from the most relevant sources and add value to their company." (Ibid.: 374)

Relevance for the research interest of this study and criticism

Apart from offering a valuable classification of factors influencing the choice of information sources in a complex and challenging work environment, the study by Alwis et al. (2006) provides a comprehensive review of relevant literature in the field of INSU research. In the line of the here presented analytical models this study rather represents a full overview of influence factors than offering an explanatory model regarding the interplay of the identified dimensions and factors. The review of existing studies on information source usage, however, provides significant findings for the research interest of this study. On the one hand, the relevance of personal contacts as major sources of information emerges as central theme for task-based information seeking in such complex workplace environments as described above. On the other hand, the research shows that there is a need to further extend existing analyses by considering emerging technologies and information environments, such as the social web. As the classification of influence factors has shown, however, the potential of social software applications to serve as valuable sources of information in the workplace does not only depend upon the characteristics of the respective sites and their content but upon a variety of aspects, such as ease of use, respond speed of source, level of trust, or information richness. To what extent the conclusions from Alwis et al. apply for the subject group of young professionals in management consulting, however, will need to be evaluated.

3.3.2 Relevant process models of task-based information seeking

In addition to the analyses of an employee's context, the different factors that influence the way information is sought and the type of chosen information

sources, information seeking research examines the different activities an individual engages in when being confronted with a new task or an information need. Hence, there is a rich and diverse field of INSU research that describes the information seeking behavior of certain user groups in a process structure of sequential phases of activities. This perspective has the advantage of describing a closed timeframe of information seeking and use, which may be observed and categorized more easily and precisely than such abstract and general features as in the previously presented analytical models. As a result, all of these process models are strongly connected with the concept of task and the initiation of information seeking activities by a specific information need. Their common goal is to identify recurring patterns of human behavior in order to anticipate certain actions, thoughts or feelings. This way information (retrieval) systems, user interfaces, or information environments in general may be adapted to certain contexts and user needs.

Table 6: Classification of process models of task-based information seeking

Ingwersen/Järvelin's Model Dimensions / Info-Seeking Models & Observation	**Scope** (broad vs narrow)	**Structure** (process vs static)	**Method** (abstract vs concrete)	**Type** (summary vs analytical)	**Applicability** (general vs specific)
Ellis / Wilson (1989 / 1999)	Broad	Process	Concrete	Summary	General
Marchionini (1995)	Broad	Process	(Abstract)	Analytical	General
Kuhlthau (1991)	Broad	Process	Concrete (Abstract)	Analytical	(General)
Cheuk (1998)	Broad	Process	Concrete (Abstract)	Summary	General

Based on their relevance for the research interest described in section 1.1 and their coherence in regards to scope, structure, method, type and applicability (see table 6), the following models of task-based information seeking were selected to be reviewed:

- Ellis' characteristics of information seeking activities (1989) (arranged in a process model by Wilson (1999))
- Marchionini's sub-processes of information seeking (1995)
- Kuhlthau's stages of the information search process (1991)
- Cheuk's information seeking and using situations in the workplace (1998)

Ellis' behavioral approach to information retrieval

As explained in section 3.1.3, the presented analytical models of information seeking differ in perspective and structure from process-oriented models. The difference between these perspectives is best demonstrated with the help of the research by Ellis (1989) and Wilson (1999). In the "behavioral approach to information retrieval system design" (Ellis 1989) the information seeking patterns of academic social scientists was analyzed and categorized in a static set of six features of information seeking:

> "*Starting*: activities characteristic of the initial search for information;
> *Chaining*: following chains of citations or other forms of referential connection between material;
> *Browsing*: semi-directed searching in an area of potential interest:
> *Differentiating*: using differences between sources as filters on the nature and quality of the material examined;
> *Monitoring*: maintaining awareness of developments in a field through the monitoring of particular sources;
> *Extracting*: systematically working through a particular source to locate material of interest." (Ibid.: 178)
>
> "This work was extended to physicists and chemists in studies which found that the original model fits behavior in these fields with very little modification, the principal being the addition of the categories:" (Ellis/Haugan 1997: 385)
> *Verifying*: checking the accuracy of information;
> *Ending*: 'tying up loose ends' through a final search. (cf. Wilson 1999: 254)

Altogether, Ellis' theoretical model of information seeking patterns provided an overview of different phases of information seeking. It remained, however, on a static level and did not define the interrelation of these steps or model their sequence of occurrence. According to Ellis the respective order would result from "[…] the unique circumstances of the information seeking activities of the person concerned at that particular point in time" (Ellis 1989: 178). Regardless of a specific process, the gathered understanding of a user's context was then used to derive recommendations for the design of an information retrieval system to account for the specific features of information seeking.

It was Wilson (1999) who transferred this static model to a process model by arranging the different stages of information seeking according to their most probable order of appearance. He presumed that "[…] it is clear that 'starting' must initiate a process and that 'ending' must end it. It also seems reasonable to suggest that 'verifying' is a penultimate stage in a process and

that ‘extracting’ must follow on from a specific search behaviour such as ‘browsing’” (Ibid.: 254). He concluded that under certain circumstances a diagrammatic presentation of Ellis’ model may be suggested that arranged the features of information seeking in a process model (see figure 14).

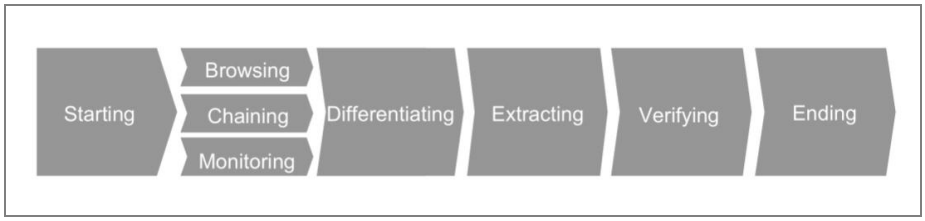


Figure 14 Wilson’s process model of Ellis’ behavioral framework of information seeking (adapted from Wilson 1999)

This adaptation of Ellis’ model did not change its original conclusions; it rather specified it according to a certain research interest. Based on this process perspective developed by Wilson different conclusions regarding the design of an information retrieval system or generally regarding the allocation of a context- and process-sensitive information environment may be drawn.

Relevance for the research interest of this study and criticism

Even though Ellis (1989) did not necessarily consider the classic (industrial) workplace environment, this theoretical model of different features of information seeking and their sequential arrangement by Wilson (1999) provides a valuable understanding of different phases and activities of active information seeking relevant for the research interest of this study. The description of the different activities involved in the way social scientists generate, communicate and utilize information draws a very detailed picture of task-based information seeking. Furthermore, it represents one of the most influential models that coined the cognitive perspective “[…] of using the behavioural aspects of users’ information seeking activities to inform the design of information retrieval systems (which is a commonplace of the user studies literature)” (Ellis 1989: 202). It may be assumed, however, that the strong focus on electronic information retrieval systems disregards the role of other relevant information sources in the workplace context of this thesis. Still, its fit for modeling task-based information seeking behavior of young professionals in management consulting needs to be evaluated.

The Information Search Process by Kuhlthau

One of the most widely received process models of information seeking is Kuhlthau's information search process (ISP) (1991; 1993a; 2004; Kuhlthau et al. 2008). Based on a series of empirical studies in a library and information setting, this model identified the different stages of thoughts, feelings and actions secondary school students undergo during an extensive research assignment. During the 90s, the model was further extended to other contexts and user groups and thus established the ISP as a central concept of information seeking research. With its particular focus on the affective component of information seeking, Kuhlthau described the levels of uncertainty and frustration that individuals experience in the respective stages of information seeking. The model aligns the affective, cognitive and physical level along the identified stages of information seeking (see figure 15).

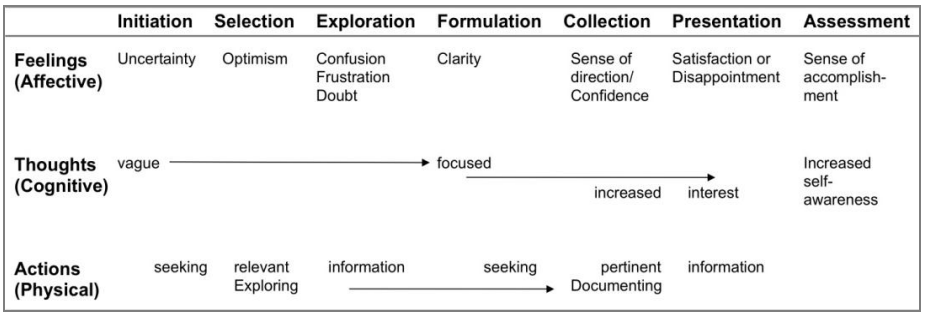


Figure 15 Kuhlthau's affective model of the Information Search Process (adapted from Kuhlthau 2004: 82)

According to this model, the beginning of each information search process is characterized by an '***initiation***' phase. This is where the individual becomes aware of a gap in knowledge or a lack of understanding and thus feels confronted with a high degree of uncertainty. (cf. Kuhlthau 2004: 45 ff.) Accordingly, the thoughts are still described as vague and the main action is to discuss possible ways of how to approach the problem at hand. In the following '***selection***' stage "[…] the task is to identify and select the general topic to be investigated and the approach to be pursued" (Ibid.: 46). Once a selection has been made, optimism arises and the requirements of a task as well as the overall conditions for solving the problem are assessed. Often a preliminary search is conducted in order gather an overview of alternative topics and approaches. In contrast to the common assumption that uncertain-

ty is continuously reduced during the process of information seeking, Kuhlthau then observed that in the following phase of '***exploration***' individuals tend to feel confused and uncertain. This is explained by the fact that information on the general topic is gathered in order to extend the personal aspects of the topic, while the individual is still unable to express precisely what information is needed.

> "Actions involve locating information about the general topic, reading to become informed, and relating new information to what is already known. In this stage the information encountered rarely fits smoothly with previously-held constructs, and information from different sources frequently seems inconsistent and incompatible." (Ibid.: 47)

The following stage of information seeking, called '***formulation***', is considered to be the turning point of the ISP. A focus is selected from the previously gathered overview and uncertainty diminishes while confidence increases. The individual now has regained orientation and can go on to formulate queries for a retrieval system or any other type of information source. In the '***collection***' phase the search is conducted and information related to the focused topic is gathered. Kuhlthau states that "[…] the person, with a clearer sense of direction, can specify the need for pertinent, focused information to intermediaries and to systems, thereby facilitating a comprehensive search of available resources" (Ibid.: 49). Finally, stages of '***presentation***' and '***assessment***' describe the conclusion of a search, the consolidation of the gathered information and the evaluation of the achieved accomplishment.

Relevance for the research interest of this study and criticism

As it is characteristic for this type of holistic and cognitive research, Kuhlthau employed a variety of research methods. These ranged from journals, search logs, questionnaires, interviews to assigning participants certain tasks (e.g., write a paragraph or draw a flowchart of the process they had followed). Consequently, Kuhlthau's research provides insights into a variety of data gathering methods and the level of detail of the concluding results. The derived model provides a deep understanding of the affective components of information seeking and identifies common activities and stages of the information search process. Altogether, it appears to provide a promising basis for understanding the way young professionals seek information in the workplace with the right level of scope and perspective relevant to this thesis. Even though the ISP has been applied to other contexts and user groups, however, the summarized descriptions of the process stages expresses

Kuhlthau's primary research focus on the role of intermediaries and libraries for supporting academic scholars and students in their research. Also the affective component of information seeking shall not be of central interest to this study. While Kuhlthau's ISP offers detailed insights into the emotional states of the information seeker, it does not go beyond the level of activities in order to classify and analyze the role of information sources. Furthermore, the ISP lacks the consideration of external influence factors such as time constraints, task complexity or source accessibility. This criticism, however, applies to almost all process models of information seeking and will be further discussed below.

The sub-processes of information seeking by Marchionini

Another central process model of INSU research that needs to be considered for the purpose of this study is Marchionini's (1995) study on information seeking in electronic environments. This model also represents the discussed scope of information seeking as the author considers it to be a fundamental human process closely related to learning and problem-solving that is a directed (purposeful) activity (cf. ibid.: 6). The following description of the interrelation of different theoretical concepts such as learning with information seeking emphasize the importance of this type of research for the organizational and workplace-related perspective. Marchionini considered information seeking to be:

> "[…] a type of learning, because the goal in both cases is to change knowledge. Information seeking differs from learning according to the degree of retention desired; learning demands retention and information seeking may use the information for a temporary task. Much of information seeking may require identifying and retrieving previously stored information." (Ibid.: 8)

He categorized the relationship among key processes in the workplace environment as depicted in figure 16.

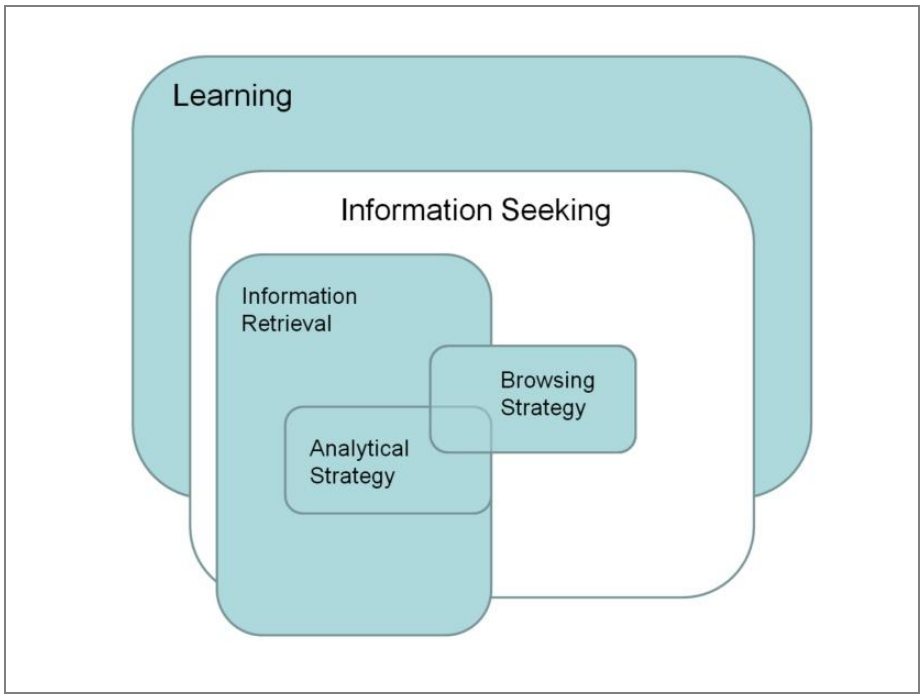


Figure 16 Marchionini's categorization of the relationship among key processes (adapted from Marchionini 1995: 9)

Within this theoretical framework Marchionini focused his studies on intentional information seeking as a process driven by an information problem. This process is composed of a set of sub-processes. As a result of his research, Marchionini defined the following stages of information seeking as follows (cf. ibid.: 51 ff.):

- **Recognize and accept an information problem**: This sub-process can be either internally or externally motivated. The model defines this phase to build the awareness of the individual that a problem exists and needs to be solved by engaging in information seeking activities. This stage therefore may be compared to the above described stage of 'initiation' by Kuhlthau.
- **Define and understand the problem**: Having accepted a new problem (or task), the next critical step is to define and understand the problem. It is a main characteristic of Marchionini's model that a sub-process is not necessarily limited and may also coexist with any of the other sub-processes. Accordingly, this stage remains active as long as the information seeking progresses. In order to come to an understanding and define

the problem, it must be limited, labeled and a form or frame for the answer determined.

- **Choose a search system**: Choosing an information source in order to seek information relevant to the defined problem depends on the individual's previous experience with the task domain, the scope of his or her personal information infrastructure and the expectations about the answer that may have been formed while defining the problem and the task. Marchionini points out that "[…] it is well known that information seekers prefer colleagues or human sources to formal sources and then proximate sources of information and easy-to-use systems" (Ibid.: 52).
- **Formulate a query**: The granularity of this model is revealed by this sub-process and is a result of Marchionini's focus on the use of interactive information retrieval systems and the design of the human-computer interface. Thus, query formulation is defined as a phase of information seeking. It involves matching the perception of the task with the system selected. Marchionini reported that "[…] in most cases, the first query formulation identifies an entry point to the search system and is followed by browsing and/or query reformulations" (Ibid.: 53).
- **Execute search**: Once the query has been formulated, physical actions to access an information source are executed. These are influenced by the information seeker's mental model of the search system. The execution of a search also depends on the accessibility of the source and may include actions like articulating a question verbally, picking up a volume, or pressing a key.
- **Examine results**: The list of results or information retrieved from the information source needs to be examined. This is done in to assess the progress towards completing the information-seeking task.

  > "This examination is dependent on the quantity, type, and format of the response and involves judgments about the relevance of information contained in the response. Situational relevance (in comparison with logical relevance) is more specific to the relevance judgments that information seekers make as they examine intermediate results of search." (Ibid.: 55)

- **Extract information**: Examining the results of a search is highly interlinked with extracting information from the gathered information objects. This requires a series of activities such as reading, scanning, listening, classifying, copying and storing information. As information is extracted, it is manipulated and integrated into the information seeker's knowledge of the domain.

- **Reflect/Iterate/Stop**: Finally, the individual evaluates the progress in regards to the identified problem. This provides the basis for the final decision of whether to iterate or stop the process of information seeking, which applies criteria such as completeness, quality, time and effort.

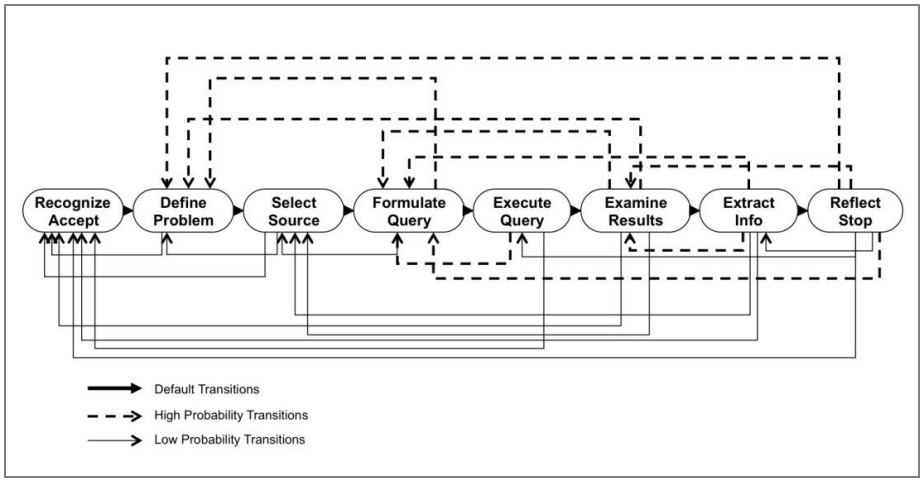


Figure 17 Marchionini's model of sub-processes of information seeking (adapted from Marchionini 1995: 50)

These sub-processes may be "[…] considered as functions or activity modules that may be called into action recursively at any time" (Ibid.: 49). Accordingly, the process of the defined stages of information seeking is highly iterative (see figure 17). This is expressed by the transitions of high or low probability included in the model. As a consequence of this research on information seeking behavior, Marchionini called for the design of highly interactive user interfaces that consider the described human behavior and support the access to electronic information environments.

Relevance for the research interest of this study and criticism

The work of Marchionini is relevant to the research interest of this study in many ways. As mentioned in section 1.1 and further elaborated above, the perspective on information seeking in the workplace to be a part of knowledge work and learning is highly significant for the work context of young professionals in management consulting. Furthermore, the scope and perspective of the defined sub-processes of information seeking allow for a detailed understanding of common activities and processes individuals engage in when being confronted with a new problem. With a focus on the design of

user interfaces for accessing electronic information environments, Marchionini's research provides a sound basis for analyzing ways of integrating social software as an information source in the existing information environment at the workplace. As Kuhlthau's model of the ISP, however, the level of detail does not necessarily match the perspective of this study. The granularity of the identified sub-processes is very high. Differentiating between query formulation and query execution, for example, might be useful when analyzing the interaction of individual's with a specific information retrieval system, but does not apply to the usage of information sources with less interactivity and control. Furthermore, the model lacks a deeper analysis of different information sources and their role for each stage of information seeking. Hence, a differentiated analysis of the potential of social software to support any of the sub-processes in particular may not be possible. Finally, the above mentioned criticism of Kuhlthau's ISP regarding the lack of consideration of contextual influence factors on the information seeking behavior also applies.

Cheuk's Information Seeking and Use Process in the Workplace

Ultimately, a process model of information seeking behavior developed by Cheuk (1998) shall be reviewed in the context of this doctoral dissertation. With the aim "[…] to empirically develop a model, referred to as information seeking and use process model (or ISU process model), that can meaningfully reflect real-life practice" (Ibid.). Cheuk studied the workplace context of auditors and engineers in Singapore. This subject group was chosen since "[…] they have long been recognized as 'knowledge workers' who have to access, use, evaluate and generate large amount of information at work" (Ibid.). Participants of this study were interviewed regarding their everyday audit assignments or engineering projects and how they seek and use information in order to answer questions they have in mind. This way a set of characteristic '*ISU situations*' were extracted and stabilized in order to form a framework for identifying information behavior (which include physical, cognitive and affective aspects of information seeking and use activities) distinctively associated to each ISU situation (cf. ibid.):

> "*Task Initiating Situation*: this is the situation when participants perceive they have a new task to work on;
>
> *Focus Forming Situation*: this is the situation when participants perceive they have to gain a better understanding of how they should go about carrying out their tasks or solving problems;

Ideas Assuming Situation: this is the situation when participants are forming ideas about how to carry out their tasks or to solve problems;

Ideas Confirming Situation: this is the situation when participants are trying to confirm the ideas they have assumed;

Ideas Rejecting Situation: this is the situation when participants encounter conflicting information or they cannot get the answers they need to confirm their assumed ideas;

Ideas Finalising Situation: this is the situation when participants are trying to seek formal consensus to finalise their ideas;

Passing on Ideas Situation: this is the situation when participants are presenting ideas to targeted audience." (Ibid.)[33]

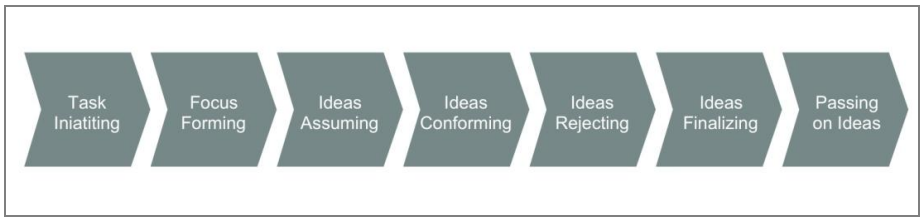


Figure 18 Seven Information Seeking and Using (ISU) Situations in the Workplace (adapted from Cheuk 1998)

Apart from defining these phases of information seeking, which were arranged in a process (see figure 18) but were not necessarily considered to follow any specified sequential order, Cheuk analyzed the correlation of each situation with the participants':

- choice of information sources,
- information relevance judgment criteria,
- information organization strategies,
- information presentation strategies,
- feelings, and
- definition of information.

33 In the full doctoral dissertation of Cheuk (1999) three more situations were categorized: 'Approval Granting', 'Design Generating', and 'Approval Seeking'. It was, however, not possible to get access to this publication (even though the author was contacted as proposed under http://communication.sbs.ohio-state.edu/sense-making/diss/dissabscheuk99.html). Accordingly, it will be referred to the results published in Cheuk (1998).

Thus, it attenuates great parts of the earlier described criticism of other process models of information seeking. Cheuk comes to the conclusion, for example, that in 'ideas conforming' and 'ideas rejecting' situations people turned to specific and authoritative information sources, while they used easily accessible, general information sources (e.g., magazines and Internet) in 'focus formulating' situations (cf. ibid.). Furthermore, it was found that:

> "[…] in Task Initiating and Focus Formulating Situations, 'information' is referred to as data, events, physical items, figures, words etc. In Assuming Ideas Situation, information becomes 'those raw data which can be applied'. In Ideas Confirming and Rejecting Situations, 'information' is evidence, testing results, facts and reasons. In Ideas Finalising Situation, 'information' is feedback and consensus from boss and clients. And in Passing on Ideas Situation, 'information' is personal knowledge, assets, value-added and filtered management information." (Ibid.)

Relevance for the research interest of this study and criticism

In particular, this final analysis of correlations between the different situations of information seeking and use and the above listed elements distinguishes this model of task-based information seeking from those previously mentioned. Cheuk's (1998) scope and the subject group and context of the study promise to be highly relevant for the research interest of this thesis. The convergence of the process and analytical perspective expressed by the analysis of differences in information source usage according to the identified ISU situations reveal first steps into the right direction of accounting for the criticism of prior models. The level of detail, however, with its reference to the concept of ideas as driver of information seeking behavior appears to be very abstract. A detailed analysis will have to prove whether the concepts and phases of this model may be applied to the context of management consulting and therefore serve the purpose of this doctoral dissertation.

3.3.3 Summary of relevance and criticism of analytical and process models

Reconsidering the statement by Vakkari et al. (1997) that "[…] one task of information needs and seeking (INS) studies is to create knowledge which supports humans and organizations in their use of information and their design of information systems" (Ibid.: 7), the above presented findings of analytical and process models of task-based information the relevance of each of

these studies for and influence on this PhD project is evident. In order to be able to analyze the role of social software as an information source in the workplace of young professionals and to determine ways to adapt the existing information environment in a specific context accordingly, the context itself, the information environment and common behavioral patterns of this user group need to be thoroughly understood. While analytical models present valuable explanations for the influence of different contextual factors on the information seeking and the choice of information sources, process models identify common activities of information seeking and their sequential order.

As a result of the analytical perspective, the different influence factors of information seeking behavior of individuals in a specific context may be identified and thus conclusions may be drawn with regards to the design of information environments or specific information (retrieval) systems. Hence, this analytical (and mostly static) perspective on the user context provides valuable insights for the research interest of this thesis. It enables the identification of relevant elements and factors in the workplace of young professionals that influence the way they seek information and use specific sources of information, such as social software applications. Which of the different factors that were identified in previous studies play an important role in the workplace of young professionals in management consulting and in how far they are suited as explanations regarding the choice (or denial) of social software applications as sources of information will need to be investigated in the course of this doctoral dissertation.

As a result of the process perspective, common activities of information seeking and their sequential order may be identified in order to anticipate typical actions, thoughts and feelings an individual might encounter in the process of solving a specific task. The previsouly presented process models offer different classifications of these activities and model their procedural occurrence. In most of the cases, however, they have a slightly differing perspective or have been developed in the context of higher education, libraries, or with very specific test groups such as engineers, nurses, or physicians. Furthermore, previous studies have shown that information seeking rarely is a uni-directional and self-contained process. Conceptual models of the process perspective on task-based information seeking therefore need to account for iteration and multi-directional paths. Altogether, the fit of the existing models of task-based information seeking for the purpose of analyzing the role of social software as an information source in the workplace environ-

ment of young professionals in management consulting will be further evaluated in section 5.3.1.

Thus, the presented existing conceptual models for task-based information seeking of professionals are well suited to guide the development of the research questions and methodical approach of this thesis. It has been shown, however, that the analytical and process perspective in INSU research so far seem to coexist without considering findings from the respective other. In order to serve as a theoretical framework for modeling task-based information seeking behavior of young professionals in management consulting, all of the concepts and findings of previous research ought to be combined. The resulting model should describe the different activities of information seeking and furthermore include such interdependencies as the choice of information sources or the order of information seeking activities with the complexity of the task at hand or the type of information needed to solve it.

3.4 The information seeking behavior of young professionals

In addition to the general findings in INSU research regarding the task-based information seeking behavior in the workplace, studies with a focus on young professionals shall be reviewed. The importance of this subject group is not only justified by the research interest of this study but also by the role that information seeking plays for newcomers in a corporate organization. As Marchionini (1995) has pointed out: "[…] information seeking is often a type of learning, because the goal in both cases is to change knowledge" (Ibid.: 8). Accordingly, new joiners naturally are highly dependent upon effective information seeking strategies and the competency to find the information required in order to enter into existing organizational structures and to meet the demands of their newly acquired work role and first work tasks. The enablement of such processes is not only a question of personal development but also of organizational performance. It is a key to success for today's corporations to bring new employees up to speed effectively, so they can soon start to create a value-add for the business. Apart from their own educational background and expertise job entrants might bring along, they will need to

learn, i.e., seek information from colleagues, clients and from their own personal experience in their first years in the workplace.

As section 2.2.2 has shown there is a variety of studies on the media and information source usage of young adolescents in general. Furthermore, section 1.1 has revealed that the information seeking behavior of professionals and its influence factors have been analyzed to a large extent. Investigations that combine these perspectives and examine the information seeking behavior of young professionals in their first years in the workplace, however, are rare. Only a few studies can be considered relevant prerequisites for the research interest of this doctoral dissertation. Miller and Jablin (1991), for example, examined the information seeking behavior of new employees during organizational entry. This was also the research interest by Morrison (1993) who explored the types, modes, sources and outcomes of newcomer information seeking. Furthermore, these studies shall be reviewed in an exemplary manner in order to guide the identification of possible specifics in the information seeking behavior of the defined subject group of this thesis.

Miller and Jablin (1991) described the specific situation of newcomers in corporate organizations to be characterized by some degree of shock or surprise, high levels of uncertainty and perceived inadequacies in the nature and scope of the information they are presented with. These aspects complicate the individual's efforts to engender sense of competence in the work role and a sense of acceptance into the organization (cf. ibid.: 92). In this situation newcomers often switch from feeling overloaded by the information available to a sense of '*information deprivation*', i.e., the perception "[…] that they receive less information from those around them than they believe is needed" (Ibid.). As a result, Miller and Jablin came to the conclusion that:

> "[…] information seeking is particularly important and somewhat unique during organizational entry. […] New hires (especially those just entering their chosen profession) are likely to experience considerably higher levels of role-related and career uncertainty when entering a new environment than at any other time during their organizational tenure. […] In other words, their heightened sense of uncertainty leads newcomers (1) to be conscious of values and behaviors to be learned and (2) to often think about what they do not know and how to obtain the information they desire. As a consequence, when individuals are new to an organization they may seek information in a far more deliberate manner than when they have grown accustomed to their roles and their organizational environments." (Ibid.: 94)

In the course of their study, the authors then further evaluated the different '*information seeking tactics*' newcomers employ for obtaining required in-

formation. These strategies range in their overtness and the specificity of the information sought. For example, job entrants might seek specific information (e.g., task information) and at other times seek more generalized information such as a colleague's perception of a certain situation or experiences with regards to previous work (e.g., task-solving information) (cf. ibid.: 103). In essence, newcomers were found to utilize a wide repertoire of information seeking behaviors that may be described in seven information seeking tactics:

> '*overt questions*': "This tactic is likely to be utilized when newcomers are comfortable with soliciting information from a source (i.e., attempt is conducive in terms of target openness and anticipated social costs) and involves direct interaction with information targets." (Ibid.)
>
> '*indirect questions*': "[…] involves the use of indirect questions (e. g., noninterrogative questions) and is typically used when newcomers are uncomfortable in seeking information from a source." (Ibid.: 105)
>
> '*third parties*': "[…] involves third parties as information sources and substitutes a primary source (e.g., supervisor) with a secondary source (e.g., coworker). This tactic is typically used when the primary source is unavailable and/or when newcomers feel uncomfortable in seeking information from a primary source." (Ibid.: 105 ff.)
>
> '*testing limits*': "[…] involves testing limits or the creating of situations to which information targets must respond. Targets' responses are monitored by information seekers in an attempt to gain insight into targets' attitudes toward particular behaviors or issues." (Ibid.: 106)
>
> '*disguising conversations*': "[…] involves the disguising of information-seeking attempts as a natural part of conversations, and it is typically used when information seekers wish to appear nonchalant in their attempts." (Ibid.: 108)
>
> '*observing*': "[…] involves observing targets' behaviors in salient situations and is typically used when individuals wish to unobtrusively obtain information concerning a target's attitude or information about how to perform a task." (Ibid.: 110)
>
> '*surveillance*': "[…] involves the use of a surveillance or a monitoring mode. This tactic is also inconspicuous, and it may be used by individuals at any time. A chief distinction between a surveillance tactic and an observation tactic is that surveillance is based primarily on retrospective sense making and is indiscriminate in the cues to which individuals pay attention." (Ibid.: 111)

Incorporating the analytical perspective of information seeking research (see section 3.3.1) these information seeking tactics were finally modeled with regards to their interplay with other relevant contextual factors identified to influence the information seeking behavior of newcomers (see figure 19). Thus, Miller and Jablin (1991) – early on in the emergence of the cognitive

approach of INSU studies – provided an analytical model describing how different information seeking tactics, key sources of information, types of information and the subjective perception of uncertainty and social costs of information seeking as well as levels of role ambiguity and role conflict of newcomers during the stage of organizational encounter interrelate (see Figure 19).

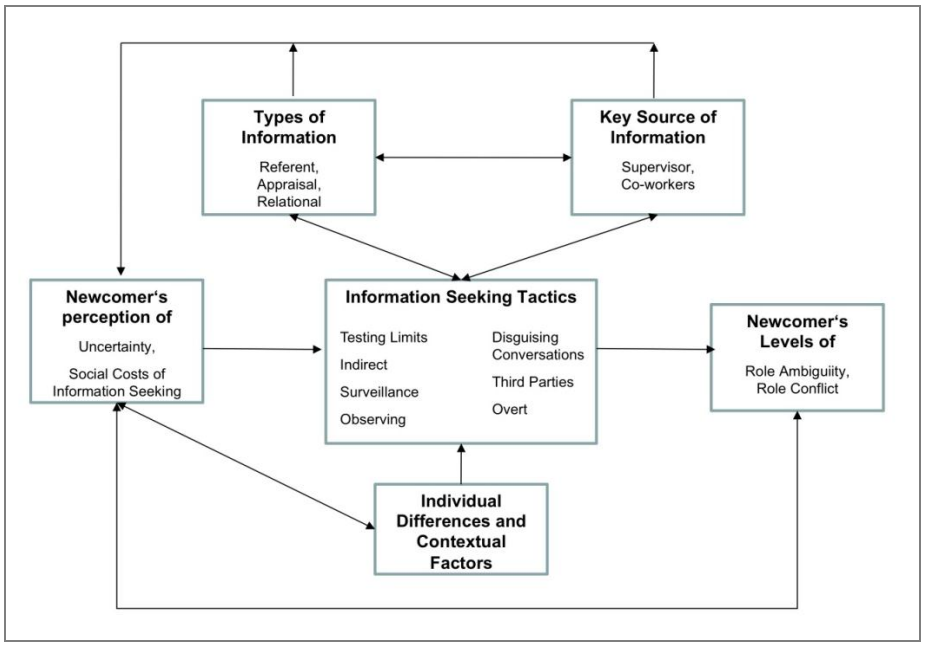


Figure 19 Newcomers' information seeking behaviors during organizational encounter (adapted from Miller/Jablin 1991: 96).

The study by Miller and Jablin (1991) provides a good understanding of the relevance of analyzing information seeking behavior of young professionals. Their model offers a broad overview of different factors and tactics of information seeking in the phase of organizational entry. The main focus of this analysis, however, was on the socialization of new employees in an organization and their taking over new work roles. As such, it is less task-oriented and does not necessarily provide the adequate theoretical model for analyzing the role of a specific class of information sources in the information environment of young professionals. Furthermore, it has to be noted that the information environment as well as organizational requirements have changed significantly from the time of the study until today. Still, these find-

ings provide valuable concepts and observations that may guide the design of the methodical approach of this thesis. Even though the level of detail does not match with the research interest of this study, such information seeking tactics as 'overt questions', 'indirect questions' and 'third parties' may offer relevant use cases for the active use of social software applications as sources of information in the workplace.

While these tactics are all forms of active inquiry and express the notion that newcomers are particularly 'proactive agents' (cf. Miller/Jablin 1991), Morrison (1993) substantiated the different types of information that were actively sought by job entrants and the distribution of active inquiry and monitoring. Therefore, surveys were given to 205 new accountants one, three and six months into the job at five large firms, ranging in size from 1,000 to 5,000 employees. This study focused on recent college graduates assuming their first permanent jobs and assessed their information seeking, self-confidence, satisfaction and intention to leave. The empirical data was extended by performance information given by supervisors. "For each type of information, respondents were asked to indicate the frequency with which they had engaged in a variety of seeking behaviors. […] The newcomers were also asked to indicate the frequency with which they had monitored for information" (Ibid.: 566). The different items were factor-analyzed and different hypotheses regarding the frequency of use of different sources and types of information as well as the correlation with the job entrants' self-confidence, satisfaction and intention to leave were assessed. The results indicated that newcomers:

> "[…] sought technical [i.e., factual] information primarily by asking others but sought other types of information primarily through observation. Further, they sought technical information, information about role demands, and performance feedback mostly from supervisors but sought normative and social information mostly from peers. These patterns were stable over time." (Ibid.: 557)

Finally, Morrison concluded that:

> "[…] in the process of trying to adjust to their new jobs and organizations, the newcomers in this study sought five distinct types of information, using different modes and sources depending on the information type. The more information that newcomers sought, the more satisfied they were, the better their performance, and the less inclined they were to leave their jobs. These findings enhance our understanding of newcomer socialization as well as our understanding of information-seeking processes in organizations." (Ibid.: 584)

Adding the perspective on information types and sources sought by young professionals in the workplace environment to the earlier presented findings, the specific character and relevance of this subject group's information seeking behavior is evident. As a result, the findings – especially in regards to different types of information and their relevance for newcomers – need to be considered when analyzing the role of social software as an information source for this specific group of employees. As mentioned above, however, these findings are somewhat limited in their relevance to the research interest of this doctoral dissertation as is revealed by the following observation in the course of Morrison's study: "Other impersonal sources, such as computers, were not relevant for these respondents" (Ibid.: 566). It may be assumed that the role of the electronic information environment has changed significantly since the time of the study, so that the findings of previous INSU research such as the above need to be reconsidered in new circumstances of ubiquitous access to digital information.

More recent studies that take emerging electronic information sources into consideration and focus on the specific subject group of young adolescents are rare. As mentioned in section 1.1, there is a variety of studies with a focus on the information source and media usage of the *net generation*. In this context Oblinger and Oblinger (2005) have argued that this generation of young individuals is qualitatively different in its informational behaviors and expectations; they are expected to multitask and expect their information resources to be electronic and dynamic. "The Net generation will expect to be able to use Web resources to conduct lookup, learning, and investigative tasks with fluid user interfaces" (Marchionini 2006: 46). While these studies may provide a valuable understanding of the general affinity of young adults for the Internet and the social web, they do not consider the entire process of task-based information seeking nor do they examine the workplace environment. There are other publications that consider the information seeking of young adults, students, or children and their use of the World Wide Web as an information source, but also rather consider health information seeking or everyday life information seeking.

In regards to the progress that has been made in INSU research Miller and Jablin (1991) commented that "[…] although the manner by which newcomers cope with or make sense of their new organizational environments has been a focus of interest for some time, very few theoretical or empirical investigations have considered the means by which individuals acquire information" (Ibid.: 114). Reviewing today's state of the art in the field of infor-

mation seeking research, this statement is still valid and further motivates the research interest of this thesis.

3.5 Social software in information seeking research

Apart from the specific subject group, the object of investigation is characteristic to the perspective of this thesis. As mentioned in section 2.1 the rise of the social web challenges the design of the corporate information environment and has received a lot of attention in the public sphere as well as in a wide range of scientific disciplines (see table 2). Ultimately, the field of information needs, seeking and use studies has started considering the impact of social software on existing findings. Shah et al. (2009) highlighted the importance of considering the rising phenomena of the social web in information seeking research as follows:

> "As new venues of information and tools for information access are emerging, people's online information seeking behavior is dramatically evolving. While a majority of well-established and classical models of information seeking and behavior are still valid, there is a growing need to study and explain novel information sources and information seeking behaviors that are unique to these sources." (Ibid.: 205)

It can be noted, first of all, that in the area of statistical usage studies in a given context, a variety of findings have been published regarding the use of social software as an information source in general. In their 'Information Literacy Report' for example, Eisenberg and Head (2009) have surveyed how college students seek information in the digital age. They captured the information source usage of students (n = 2,318) in given teaching/learning-situations as well as in everyday situations. As a result, they define four search contexts:

> '*Big picture*': finding the summary or background of a topic;
>
> '*Language*': finding the meaning of words or terms, related to a topic;
>
> '*Situational*': figuring out how far to go with research activities depending on situational factors;
>
> '*Information-Gathering*': finding out what research has been published about a topic. (cf. ibid.: 8)

Figure 20 shows that the social software applications (as defined in section 2.1.1) are firmly established in the everyday life information behavior of students.

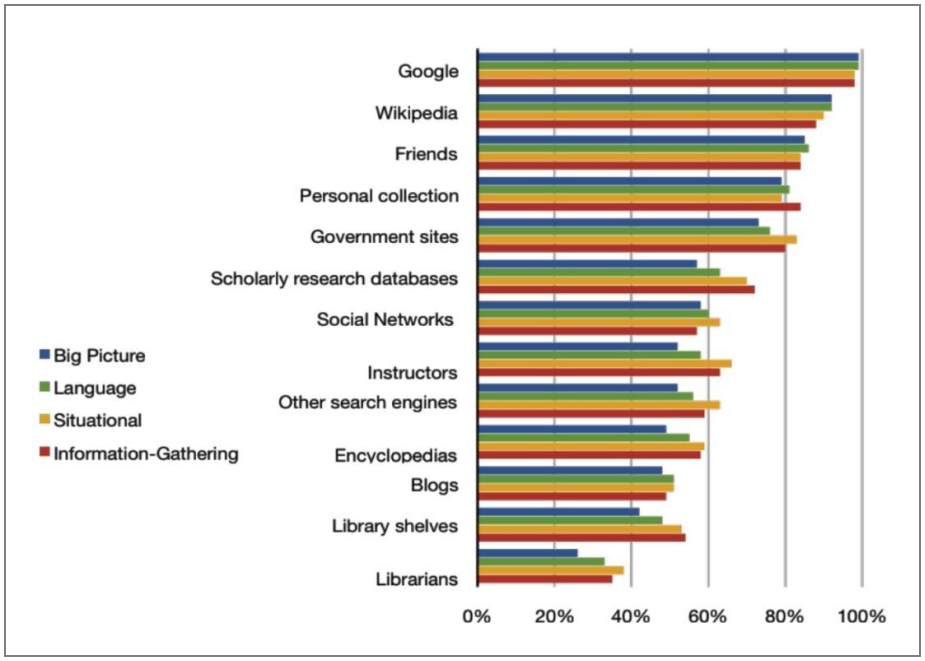


Figure 20 Resources used when everyday life research contexts arise (Eisenberg/Head 2009: 16)

The goal of such studies, however, is not to gather a conceptual understanding of behavioral aspects and their influence factors but rather the relevance and popularity of various types of information sources. Hence, they do not enable conclusions regarding the role of social software as an information source for specific work roles and tasks in the workplace. They do, however, support the overall assumptions and potential associated with transferring the popularity of such web phenomena to the workplace context (see section 2.3.2).

With regards to the analytical and process-oriented perspective, the social web and associated social software applications, such as blogs, wikis, social networks and social sharing sites, have also given rise to a variety of research initiatives in the field of task-based information seeking. In order to account for the described developments in section 2.1, Pirolli, for example, plead for a reconsideration of the information behavior model of '*information for-*

aging' he developed with Card (Pirolli/Card 1999). 'Information foraging' represents an abstract, static model[34] of information seeking, which compares seeking information with the search for food. Based on this image, different models of human interaction with information systems were originally developed, which aimed at measuring and anticipating human information behavior. In his article 'An elementary social information foraging model' Pirolli (2009) described an approach to build a theoretical foundation for shifting the perspective on an individual's information behavior towards that of several, interacting cognitive actors (cf. ibid.: 605). In his somewhat mathematical considerations regarding the costs of information search Pirolli commendably takes into account such components as cooperation and social capital. In regards to such conceptual information seeking behavior models, however, the changing information environment has only been considered very slightly. This may be caused by the fact that both information behavior and information seeking models primarily aim at conceptualizing human behavior in respect to influence factors and typical procedural activities. Therefore, they do not pay much attention to the characteristics of the referenced sources of information.

A more detailed analysis of specific social software applications and their role in the information seeking behavior of individuals is provided by Wohn et al. (2011). In a qualitative study of adult *Facebook* users it was evaluated what types of information-related goals everyday users had and how they employed the features of *Facebook* to accomplish these goals (cf. ibid.: 341). In the course of this analysis, the authors defined "[…] social information use broadly as how people employ their social networks to satisfy a range of information-related goals. In other words, people exist in social systems, and the other members of those systems can be valuable sources of information" (Ibid.: 340). Having surveyed the different use cases for social networking sites, the following three types of social information use on *Facebook* were identified: seeking information, organizing events and creating common ground. These instances of information use are supported by such technical features as status updates, media sharing, application hosting, asynchronous linking and group formation. They are considered to be particularly well-suited for supporting a wide range of information behaviors (cf. ibid. 341). Thus:

34 See section 3.1.3 for more details regarding the classification attributes of information seeking models according to Ingwersen/Järvelin (2005).

> "[…] for users seeking information or advice, the ability to access their network of Friends was potentially helpful in achieving their information goals. Many participants described posting questions to their network via status updates, or witnessing others who were doing so. […] Other examples reflected participants' need for actual help, in which they sent out a 'distress call' to their network, hoping that someone in their network would know the answer." (Ibid.: 343)

As a result of these observations, it was concluded that as social software applications (here online social networks in particular):

> "[…] become more entwined in the daily online activities of adults, they will increasingly become important tools for gathering information, both actively (in response to specific questions) and passively, through links and information posted by others." (Ibid.: 346)

While the focus of this study was the accomplishment of everyday information-related tasks and the interviewed user group consists of adults, the findings may not directly be transferred to the context of this doctoral dissertation. However, the results support the initially described assumption, that originally entertainment-based applications of the social web may well serve other purposes, such as directed information seeking. Whether the function of online social networks as source of information as described by Wohn et al. (2011) may be transferred to the professional use in the workplace environment will have to be evaluated in the course of this study.

In regards to existing research on social software in the realm of cognitive models, Fu and Kannampallil (2010) summarized in their description of a workshop on cognitive models of user behavior in social information systems at CHI 2010 that

> "[…] the widespread popularity and adoption of social information systems ranging from social networking systems to social book marking systems has resulted in an increased research focus on studying user interactions in such systems. […] There is significantly limited research on cognitive behavior of individual users in social information systems. Research on individual behavior can help us develop nuanced perspetives of social information use and can provide insights for developing more effective systems for users." (Ibid.: 4485)

This statement and the above described examples of current related research on social software in the field of information seeking, needs and use studies reveal that the conversion of the information environment in academic as well as professional contexts has been noted in the scientific community. A wide field of research on the role of social software for the information seeking behavior of cognitive actors opens up and needs to be further cultivated.

3.6 Summary

As elaborated in section 1.1, the research interest of this thesis is positioned in the field of information needs, seeking and use studies within information science. Only the holistic perspective on cognitive aspects of human information behavior enables further conclusions regarding the role of a specific family of information sources (in this case social software) in a specific context of use.

The above presented literature review of information needs, seeking and use studies has revealed that it provides a rich collection of theoretical concepts, models and methods relevant for the research interest of this doctoral dissertation. It highlights the importance of modeling context as a foundation for better understanding people's behaviors, needs and the role of specific types of information sources in a certain organizational environment. Based on the classification of information seeking models, the most relevant concepts and models for this study could be identified. Specifically the process models developed by Kuhlthau (i.a., 1999), Ellis (1989), Wilson (1999), Cheuk (1998) and Marchionini (1995) have been recognized to share a common perspective on the cognitive actor and the context of use of information sources. Furthermore, analytical models regarding the interplay of contextual factors such as information need, task complexity and type of information (Byström (1999), Byström/Järvelin (1995)) and central concepts of task-based information seeking of professionals by Leckie et al. (1996) have been introduced as foundation for the research interest of this thesis. However, the literature review has identified a variety of shortcomings that need to be addressed in the course of this study.

Whether the existing findings, for example, can be considered valid for the context of management consulting and the subject group of young professionals needs to be investigated (see section 1.1). As Byström (1999) summarized in her doctoral dissertation, "[…] several interesting research questions may be derived from the above discussion. For instance, how clearly are the information types linked to the different phases of task performance, and how does task complexity specify these relationships?" (Ibid.: 126). On the way toward answering the initial considerations about the potential of social software as an information source for young professionals in the workplace of management consulting, these conceptual questions shall be approached in

order to provide a sound and context-specific model of task-based information seeking.

Moreover, since the different models on factors and processes presented above draw a multi-faceted picture of task-based information seeking but lack merging their findings to one holistic view, the identified critique of coexisting perspectives of information seeking research shall be addressed. Furthermore, it may be summarized that while the latest studies have drawn more attention to the workplace environment and collaborative processes, a wide field of research questions regarding the role of social software for task-based information seeking remains untouched.

Bringing together the point of departure of this thesis, the theoretical foundations of social software and the field of information seeking behavior research, the following chapter will further define the research problem and provide a short overview of the chosen methodical approach in order to achieve the defined research goals of this study.

4 Research problem and methodical approach

Based on the initial considerations as well as the review of existing concepts and previous findings above, this doctoral dissertation aims to contribute to the field of INSU research by meeting the objectives set in section 1.1. Thus, an empirical study was conducted in a specific corporate setting within the management consulting domain. The characteristics of this domain and the particular field of investigation are described in detail in section 4.1. In order to satisfy the overall research interest, the research problem is further defined in section 1.1 and broken down into detailed research questions. Proceeding from these questions a multi-layered research approach was designed that allowed gathering a detailed understanding of task-based information seeking and the usage and character of social software applications as sources of information in a specific context. Section 1.1 describes the developed methodology of this study, which is characterized by a combination of qualitative and quantitative research methods. Finally, section 1.1 summarizes how the various methodical steps facilitate answering the research questions of this thesis.

4.1 Study domain and setting

As described in section 1.1, the context of this study is the field of management consulting. This environment was chosen due to the nature of the work roles and types of tasks in the domain of knowledge-intensive business services (KIBS) as they were characterized earlier. This sector, however, is highly fragmented as figure 21 reveals. Krauss (2009) identified 43 different competitors in the market of corporate strategy service providers and categorized them in four sub-categories: ‘generalists’, ‘transformers’, ‘specialists: expertise’ and ‘specialists: industry’. This classification is based not on the mere size of the organization but more importantly on the spectrum of services offered and their go-to-market approach.

Even though this classification highlights some important differentiating factors of the market players of management consulting, all of these companies may be considered to provide similar workplace environments and work tasks to their employees. Characterized by traditionally young workforces with a high level of education, all of these enterprises provide project-based consulting services, which rely heavily upon professional knowledge, are either themselves primary sources of information and knowledge or use knowledge to produce intermediate services for their clients' production processes and are of competitive importance.[35]

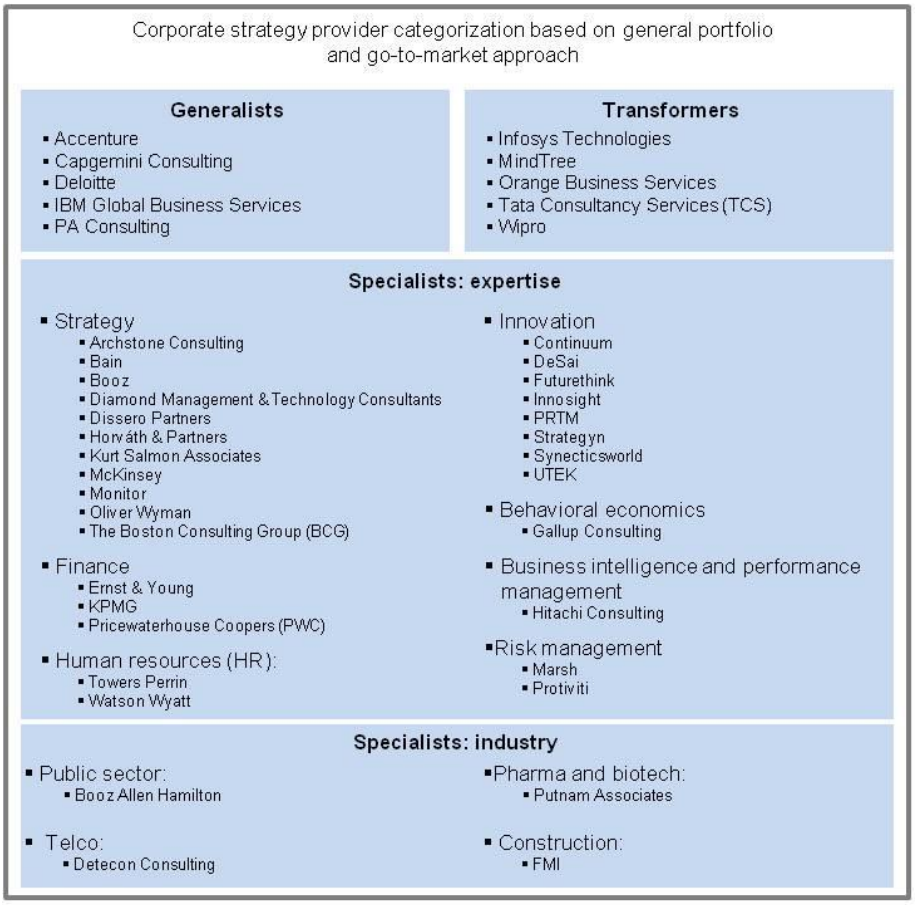


Figure 21 The corporate strategy services provider landscape with examples (adapted from Krauss 2009: 9)

35 In accordance with the three principal characteristics of KIBS as identified by Miles et al. (1995).

Furthermore, all of these market actors are traditionally mandated for temporary appointments and build ad-hoc project teams to work with a client on a defined problem scope. Thus, in order to gather a detailed understanding of this domain and to be able to transfer the general research interest of this doctoral dissertation to a specific work environment, one prototypical representative from the field of management consulting was selected for the conduction of an empirical study.

For this purpose the group of 'generalists' seemed most relevant, since they are not limiting their consulting services to a certain industry, functional expertise or regional market and furthermore characterized by typically large workforces.

> "Service providers in this category are able to leverage their broad portfolios as well as cross-functional and industry skills to support clients along the entire value chain. They offer strategy consulting as well as transformation and implementation support, while synchronizing corporate, business, and IT services expertise. Therefore, they maintain strong and long-standing relationships across clients' organizations. Recent initiatives of this group include expanding the global footprint, especially into emerging markets; driving more forward-looking research and thought leadership; as well as better integrating services across business units to strengthen the go-to-market." (Krauss 2009: 8)

As a result of common interests in regards the research problem of this thesis, it was possible to win *Accenture* over to participate in this study. Apart from the relevance of the field of knowledge-intensive business services for the research interest of this study as described in section 1.1, this company seemed particularly suitable as it had previously appeared as 'best practice' or 'early adopter' of emerging social web technologies in the workplace (i.a., Carlin et al. 2008; Richter et al. 2009; Accenture 2009). Thus, the empirical data of this doctoral thesis was gathered at *Accenture Management Consulting GmbH* (Austria, Switzerland and Germany) and *Accenture Management Consulting Ltd* (North America)[36]. These regional sub-units are part of *Accenture Plc*, a global management consulting, technology services and outsourcing company.

With approximately 215,000 employees in over 120 countries, *Accenture* does not represent the traditional small- to medium-sized consultancy. As a Global Fortune 500 company with more than US$ 21.5 billion, it can rather

36 *Accenture GmbH* grants the author a licence to use the data gathered in this study in a manner further specified between Accenture and the author of this dissertation. *Accenture GmbH* has not approved or otherwise endorsed the contents of this PhD thesis.

be categorized as generalist in the market of corporate strategy service providers. *Accenture* does not only offer strategic consulting services as the so-called 'specialists' in expertise (e.g., *Bain*, *McKinsey*, *Booz* for Corporate Strategy and *Ernst & Young*, *KPMG* in Finance) or industry (e.g., *Detecon Consulting* in the Telecommunications industry) but also provides a wide spectrum of technology consulting, system integration and outsourcing business. These very large and – economically speaking – vital parts of the company's business are very technology-oriented and do not in all aspects match the industry of management consulting described in section 1.4. Based on traditional corporate strategy consulting services, these business units describe the further phases of technology-related consulting, by turning strategic concepts into implemented or even operated solutions. Thus, these workforces offer a variety of career models and non-project related work contexts as well as work roles and tasks different from the work in management consulting. They were therefore excluded from this study, which focuses on the context described above. The observations of this thesis were gathered in cooperation with the *Accenture* consulting workforce, *Accenture Management Consulting* (*AMC*). This so-called '*growth platform*' of 53,600 management consultants worldwide is mainly organized by the functional service lines *Strategy*, *Supply Chain Management*, *Customer Relationship Management*, *Finance and Performance Management*, *Process and Innovation Performance* and *Talent and Organization Performance*.

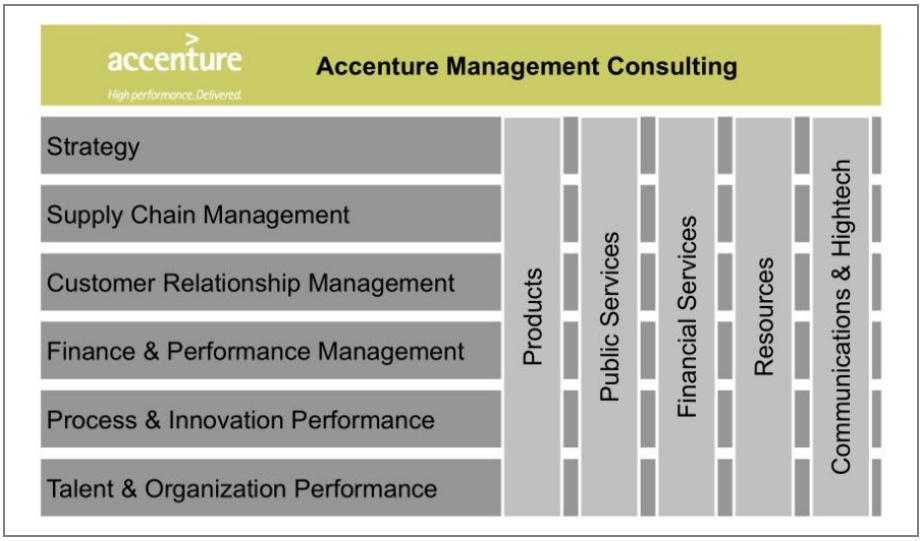


Figure 22 Organization matrix of *Accenture Management Consulting*

However, there are also smaller units, called '*client service groups*', which are specifically allocated to certain industries and offer the possibility to focus rather on a client- than function-specific career (see figure 22).

The work roles and work tasks within these units of management consulting constitute the context of this study. More specifically, the focus was on the job entrants in this growth platform. Since consulting firms are characterized by client- and project-oriented team work, they typically offer their consultants a career model, which enables them to grow their level of competence and leadership according to their capabilities quite fast. However, this model traditionally does not allow for horizontal career development, which is often referred to as '*up-or-out*' or '*grow-or-go*' policy. At *Accenture Management Consulting* the 'grow-or-go' model is applied through senior manager level, with the exception of a limited number of deeply specialized experts who have the opportunity to land at a level. On senior executive level the career model has a stronger focus on sales activities and is called '*perform-or-go*'. Accordingly, the consulting workforce draws from a certain degree of attrition and consists of a pyramid-like structure. This pyramid also refers to the degree of leadership and responsibility an employee may assume (see figure 23).

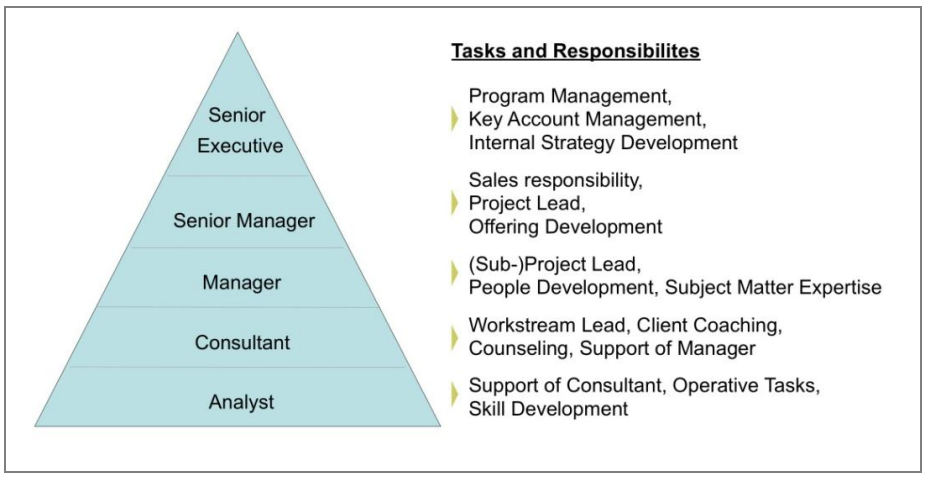


Figure 23 Career levels within *AMC*

As the description of tasks and responsibilities in figure 23 reveals, the nature of an individual's work role and context varies significantly with rising level of seniority. Drawing conclusions regarding the task-based infor-

mation seeking behavior and the role of social software for employees in the given context, is therefore restricted to a certain sample group within the workforce. In order to guarantee maximum consistency of the observations in this doctoral dissertation only members of the entry levels participated in the study. The so-called '*analyst*' level represents the entry level for new hires without prior work experience. It serves as a first orientation in management consulting practices and includes operative tasks – most commonly defined by supervising managers or senior managers. Drawn from a pool of available colleagues, analysts are drafted to a newly established or existing consulting project based on their educational background and first indications of practical experience or interest. Entering this project setting, analysts are assigned to specific work roles, detailed task descriptions and a supervising colleague. Typical work roles (depending on the service line) are 'project management support', 'process designer', 'system tester', 'training developer', 'research analyst', or 'business case development support', to mention but a few. In this matter the work context of analysts usually carries few client-facing tasks. Nevertheless, it is expected that analysts establish a self-organized, responsible and proactive professionalism. The next career level, called '*consultant*', is considered to require a certain degree of project or work experience and may include more responsibilities in regards to client-facing work or people development. This level may be reached within the first two years of corporate affiliation or as new hire with prior work experience. In regards to the tasks and responsibilities of these two entry career levels, however, the boundaries may be blurred depending on the specific project context and work role. Individuals on these levels are usually between 23 and 32 years of age[37] and have a university degree (mainly M.A., M.Sc.) in computer science, business administration, psychology, or other related fields of education. Preparing this employee group for the dynamic and challenging work environment described earlier, *Accenture* provides these young professionals with a set of core trainings regarding consulting methods, tools and basic functional know-how. After this initial training and counseling phase, analysts and consultants are furthermore steadily challenged outside of guided learning environments to individually become acquainted with the specific tasks and new functional as well as industrial characteristics of each project.

37 This mainly refers to the *Accenture Management Consulting* regional unit of German-speaking countries. The demographic statistics of *AMC* North America draw a more diverse picture of job entrants between 20 and in some cases 35 years of age.

As discussed in section 1.1, the participants of this study represent the subject group of young professionals. This allowed for a closer evaluation of a new share of the workforce and its specific task-solving behavior regarding the search for information sources and use of emerging web technologies.

4.2 Definition of the research problem

The research problem of this thesis is to model task-based information seeking of young professionals in management consulting and thus come to an understanding of the role of social software as an information source in the workplace. Therefore, it is essential to gain a deep understanding of the influence factors and phases of task-based information seeking in the given context. Furthermore the usage of information sources as well as the characteristics of the information provided by such sources need to be analyzed. This enables coming to an understanding of the role of social software as a source of information in the workplace and how to include it in the electronic information environment of young professionals. It is presumed that an adaptation of existing concepts of task and information types in information seeking is required in order to adequately model the given context of use (see section 1.1). This shall provide the basis for conclusions regarding the design of the electronic information environment of young professionals. The research problem was considered on a basis of individual work tasks in an international management consulting firm. Relating it to its actual context allowed a better understanding of the findings, its limitations and the derivation of specific conclusions for the described research interest.

4.2.1 Phases and influence factors of task-based information seeking

In order to lay the foundation for an understanding of the role of social software as an information source in the workplace environment of young professionals, the way these employees seek information needs to be analyzed. As chapter 3 has shown there exists a variety of research findings regarding task-based information seeking, needs and use of cognitive actors in interac-

tion with information environments. These findings shall be tested for validity in the given context by asking the following research questions:

- *Task complexity*: What types of tasks are most common in the workplace of young professionals in management consulting?
- *Types of information*: What types of information are most relevant to young professionals in management consulting, when confronted with common types of work tasks?
- *Phases of information seeking*: What phases of information seeking do young professionals in management consulting engage in, when being confronted with their common types of work tasks?
- *Use of sources*: What sources of information do young professionals in management consulting most commonly refer to when being engaged in the respective phases of information seeking?

Having evaluated the applicability of existing concepts, the context of use of social software applications may be adequately modeled by merging the analytical and process perspective on task-based information seeking described in section 3.1 based on findings from the observations of this study. The context-specific model of task-based information seeking that was derived, allowed for further investigating the following research questions.

4.2.2 Usage of social software and characteristics of the provided information

In order to address the overall research problem defined above, the conceptual understanding of common work task situations and the way young professionals seek information is complemented with an analysis of the usage of social software applications and the characteristics of the information provided by such sources. Having understood how members of the target group of this study approach their common work tasks in the given context, what sources of information they turn to in which phases of the process of information seeking and what type of information they are looking for, the role of social software as source of information may be recognized by addressing the following research questions:

- *Source characteristics*: What characteristics do social software applications in the professional information environment reveal?
- *Professional vs. private usage*: How often do young professionals turn to social software applications when being confronted with an information-related work task compared to general private use in their free time?

Having identified the potential of social software as an information source in the workplace as well as the actual usage behavior of young professionals, conclusions regarding the adaptation of the corporate information environment may be drawn.

4.2.3 Measures for leveraging the use of social software as a source of information in the workplace

Based on the analysis of these aspects of information needs, seeking and use in the given context, it may be concluded whether and, if yes, how to include social software in the electronic information environment of young professionals. As elaborated in section 1.1, the context of management consulting is characterized by a certain type of knowledge-intensive business services tasks and a particular workplace environment. Once the potential of the use of social software as a source of information in the workplace has been identified, these characteristics of the context of use need to be taken into consideration. Therefore, the following research questions arise:

- *Context-specific challenges and restrictions*: What are examples of challenges and restrictions to the use of social software as a source of information specifically for the context of management consulting?
- *Measures*: What are possible exemplary measures for leveraging the use of social software as a source of information in the workplace within the identified limitations?

These final research questions may not be analyzed on a general level but are highly dependent upon the respective organizational setting of a specific corporation. They shall therefore be addressed exemplarily.

4.3 Methodical approach

The research problem and corresponding research questions described above, call for a multilayered methodical design. Within information science, a vast set of research methods has been developed. Vakkari (2008) explored the trends and approaches in information behavior research based on submissions to the *Information Seeking in Context* conference in 1996 and 2008 and noted among others

> "[…] a shift in meta-theory from [a] person-centred approach to [a] person in context or situation oriented approach, more varied and holistic theoretical approaches, […] more process orientation,[…] intensive use of theoretical and methodological ideas from other disciplines, increased variety of methods and use of multiple methods" and that "[…] research has professionalized in terms of academic norms." (Ibid.: 2)

This observation supported the statement made by Ellis and Haugan (1997) that

> "[…] the field of user studies has recently experienced something of a shift both in conceptualisation and research design with the adoption of a more holistic perspective to the study of information use. This has been characterised by a change in the nature of data collection from a macro-approach, studying large groups via questionnaires or structured interviews, to a micro-approach, studying small groups via observation or unstructured interviews. But it has also, and perhaps more significantly, been characterised by a change in the nature of the approach to analysis, in particular by the explicit attempt to generate models of the information seeking patterns of the individuals or groups studied." (Ibid.: 384 ff.)

The methodical approach, which was chosen in order to answer the earlier mentioned research questions, follows these research trends (see also section 3.1.1) to a large degree. Accordingly, the study design of this PhD project is characterized by a combination of qualitative and quantitative methods in order to gain a deeper understanding of the research problem (see figure 24).

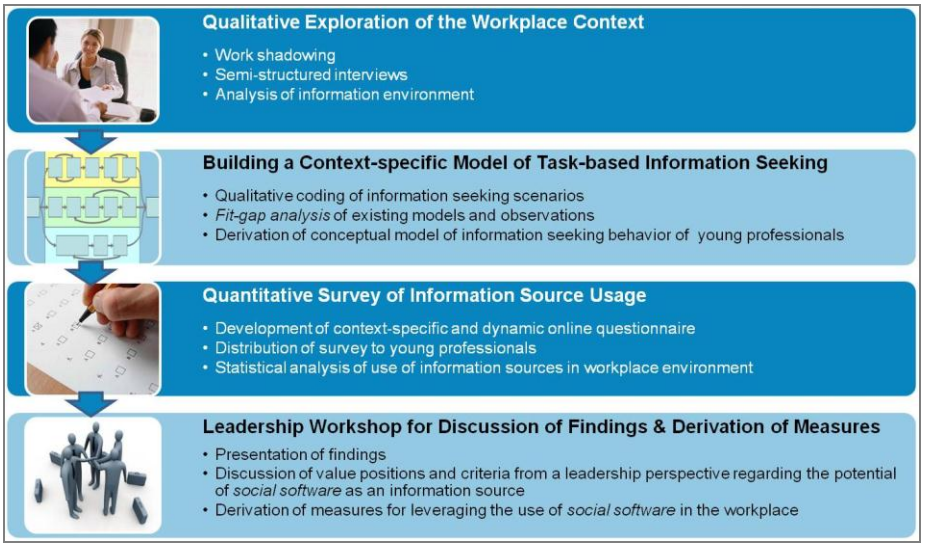


Figure 24 Study design and methodical approach

In a first qualitative step, the workplace context and existing phases of information seeking of young professionals in management consulting were explored in a qualitative study. The analysis of this context-rich data allowed the development of a context-specific model of task-based information seeking, which guided the subsequent collection of quantitative data regarding the usage of information sources. Based on the findings derived in this phase, existing concepts of INSU research were applied in order to characterize social software and the information provided by the same. The consolidation of the gathered data led to an understanding of the role of social information sources in the workplace environment. Finally, expert discussions were conducted in order to derive recommendations for the design of the information environment in management consulting.

4.3.1 Qualitative exploration of the workplace context

As described above, the methodical diversity in the field of INSU research has grown.

> "The general adoption of qualitative methods (from the early 1970s in the UK) has resulted in the work that is in the wider tradition of the investigation of human behaviour and which, therefore, is more likely to find theories and models in the social sciences that can be applied to the study of information behaviour." (Wilson 1999: 250)

Since ethnomethodologists, for example, have developed a variety of qualitative methods in order to identify processes by which people make sense of their interactions and the institutions through which they live, these approaches have proven to be useful tools for the research perspective of information science (cf. Feldman 1995: 4). Accordingly, the first methodical step of this study consisted of two central socio-scientific methodical elements: qualitative observations and semi-structured interviews[38]. These were utilized in project visits and phone interviews with 12 participants in the respective regional units of *Accenture Management Consulting*.[39]

38 The structure of the interviews may be found in appendix B. The gathered audio files from the follow-up interviews as well as the phone interviews will be provided on a separate data carrier but only made accessible to the supervisors of the dissertation in an anonymized form.

39 See section 5.1 for further details regarding the sample size and applied methodology.

First of all, the technique of '*work shadowing*' was applied in order to gain insights into the workplace environment of young professionals in knowledge-intensive business services. Therefore, analysts and consultants (of *Accenture Management Consulting* ASG) were observed during the initial phase of their project engagement. Work shadowing or 'qualitative shadowing' is a qualitative research technique that has been applied in classic management studies, information studies and other fields of social sciences. It aims at recording behavior with a view to discovering patterns in it and to investigate roles and perspectives in a detailed, qualitative way (cf. McDonald 2005: 455 ff.). According to this method, the observer accompanied the employees and their teams to the clients and tracked their information seeking and task-solving behavior at the workplace. In order to systematically record the observations, a catalogue of possible contacts, activities, sources and process phases was used and adopted during the process of observation. In contrast to other qualitative observation methods such as 'structured observation' or 'diaries'[40], there may be interaction between the observer and the subject in order to clarify meaning and purpose of the observed by encouraging the employee to think aloud.

> "At the end of the shadowing period the researcher will have a rich, dense and comprehensive data set which gives a detailed, first-hand and multidimensional picture of the role, approach, philosophy and tasks of the person being studied." (Ibid.: 457)

As previous studies have shown[41], the data gathered through observation should be refined by in-depth interviews. Accordingly, the subjects were questioned in a semi-structured interview after each shadowing session (which usually lasted one working day) in regards to the observed information behavior. This second element of the qualitative exploration provided additional perspectives in order to ground the documented observations. It allowed the clarification of the observations made in the work shadowing session, but was also used to consider further situations of information seeking outside the immediate timeframe of the project visit. This was done by employing the 'critical incident technique'. As defined by Flanagan (1954) this method is "[…] essentially a procedure for gathering certain important

40 These methods are based on existing approaches developed by Mintzberg (1970) and Stewart (1965).

41 For example, Orton et al. (2000); Hirsh (1999); or even Walker (1956) – as the first study to use this methodology.

facts concerning behavior in defined situations" (Ibid.: 335). Amongst others Choo et al. (2001) applied this method in their INSU study on information seeking and knowledge work on the World Wide Web. They claimed that the incidents to be studied should be:

> "[…] recent, sufficiently complete, and its effects or consequences sufficiently clear. In the interviews, participants described two 'critical incidents' of Web information seeking and use in reply to the following question: 'Please try to recall a recent instance in which you found information on the Web, information that lead [sic!] to some significant action or decision. Would you please describe that incident for me in enough details so I can visualize the situation?'" (Ibid.: 175)

This method allowed the respondents to describe the information problem in their own words and talk about the elements of the problem and the search for information that were meaningful to them. By thinking of a concrete situation, the respondents were able to describe the actual steps taken to find information. This method is more effective in discovering how people actually search for information than asking questions about how they would resolve a hypothetical problem (cf. ibid.: 107).

In the final part of the semi-structured interview the subjects were asked about their general information behavior. This referred to the typical proceeding when noticing an information need in the work context as well as the use of information sources to support the common phases of information seeking. Ultimately, the participants were asked how familiar they were with the concept of social software and how often they turned to such applications for private and professional use. These more open-ended questions provided important input into the construction of the design of the quantitative verification in the empirical study described in section 4.3.3.

By having applied the described methods, the qualitative exploration led to a rich amount of data, which provided a detailed overview of the common characteristics of the work context of task-based information seeking of young professionals in management consulting. On the one hand, a large variety of activities of information seeking and available sources of information in the chosen context were collected. On the other hand, the observations and interviews provided further insights regarding common types of tasks and information in the workplace environment. Thus, this qualitative work step created a profound data basis for an inductive classification and conceptualization of the context relevant to the research interest of this doctoral dissertation. Feldman (1995) stated in her book on strategies for interpreting

qualitative data that "[…] while it is well to remember this complexity and ambiguity, the task at hand is to create an interpretation of the setting or some feature of it to allow people who have not directly observed the phenomena to have a deeper understanding of them" (Ibid.: 1). Accordingly, the next methodical step of this study was to analyze these specific observations and identify general patterns, which may be summarized by a context-specific model to describe task-based information seeking of young professionals in management consulting.

4.3.2 Building a context-specific model of task-based information seeking

> "Substantive theory makes sense of a particular social context, while formal theory is generic in scope. Most of our initial theorizing is derived from the close investigation of one case or few cases. Consequently, we frequently begin to generate our ideas at the substantive level. It is, however, important to be able to go beyond the local setting of the research and to engage with formal ideas at a more general level." (Coffey/Atkinson 1996: 141)

Building a context-specific model of information seeking means reaching this general level by identifying common concepts, interrelations and behaviors of a specific target group. Such a conceptual model then allows the generation and testing of hypotheses as well as the anticipation of further behavior. Thus, a combination of inductive and deductive reasoning was applied and represented the foundation for this thesis.

Accordingly, the following methodical steps were undertaken in this part of the study: First, incidents of task-based information seeking (see section 1.1) were extracted from the gathered observation and interview data. As in previous INSU research such '*case studies*' (cf. Kuhlthau 1991) or '*narrative summaries*' (cf. Bartlett/Toms 2005) allow the focused description of relevant work task situations, which draw a detailed picture of the considered context and activities. Every relevant instance describing the way young professionals in management consulting seek information was captured in a third person scenario by the observer/interviewer. Such a concentration of the previously rich and unstructured data enables third parties to come to a graphic understand of information seeking activities in the workplace and the identification of their influence factors. By analyzing all of the gathered scenarios, common patterns and phenomena were identified. In order to compare these findings with previous empirical and analytical INSU research, a *fit-*

gap analysis (see section 5.3.1) of the observed with existing models of information seeking was conducted. In this analysis, which is similar to the method applied by Makri (2008), each incident was coded according to the most relevant models of information seeking presented in chapter 3. This allowed the analysis of the fit of existing models for the context of this study expressed in the gathered scenarios of information seeking.

The findings regarding the applicability and shortcomings of existing process models for the given research problem were then merged with observations from the qualitative exploration as well as a literature review regarding the interplay of influence factors. This finally led to the construction of a context-specific model that describes the task-based information seeking behavior of young professionals in management consulting (described in section 1.1). Together with the classification of the prevalent information environment in management consulting (see section 5.3.4) this built the foundation for the derivation of working hypotheses regarding the role of social software in the given context.

4.3.3 Quantitative survey of information source usage

The qualitative exploration that has led to a classification of the information environment in the workplace in management consulting and to the derivation of a conceptual understanding of task-based information seeking behavior of young professionals builds the foundation for the deeper analysis of information source usage and the role of social software as a source of information in the workplace. On the basis of this context-specific model the behavior of individuals, their workplace environment, types of work tasks, information needs and use of information sources could be empirically surveyed. This was done by means of an online questionnaire. Even though Ellis and Haugan (1997) had observed a shift in INSU research methods towards a more holistic and qualitative approach (as described in section 3.1.1), literature reveals that the questionnaire is still the most common data collection tool used in library and information science (cf. Alwis et al. 2006: 372). Such a survey allows the statistical analysis of common phenomena and behaviors in a population based on the answers of a sample group. But only due to the previous work steps, it was possible to determine which questions to ask and the type of language to use in order to carry out the ‘conversation’ with respondents in a way that they understood and helped them to provide the in-

formation that was sought (cf. Brace 2004: 8). Thus, having modeled the common task complexity and sequences of information seeking activities, it was possible to derive a context-specific and dynamic questionnaire. This online survey had two main goals:

- The quantitative verification of phenomena of workplace complexity, types of information and activities of information observed in the exploratory study.
- Gathering context-specific usage behavior of information sources and, in particular, of social software applications for professional as well as private purposes.

The questionnaire that was designed in order to achieve these goals will be further described in section 6.1. The results of this quantitative study represent a comprehensive supplement to the data gathered in the qualitative exploration. They provide context-specific usage statistics of various types of information sources in general and the role of social software as a source of information in the workplace in specific.

4.3.4 Leadership workshop for discussion of findings and derivation of measures

This multi-faceted perspective on how young professionals approach new information-related work tasks in the workplace environment of management consulting so far remained on a descriptive level. Confronting the actual usage of information sources and the role social software plays in their professional as well as private information seeking behavior with the identified potential, finally allows for a critical assessment based on certain value positions. Therefore, the findings of this study were confronted with the expectations and requirements of representatives of the senior leadership of the affected organization in a concluding leadership workshop with senior project managers and executive representatives from the global leadership of *Accenture Management Consulting* as well as experts from the internal *Learning & Collaboration* practice in order to identify specific interests and areas of possible conflicts.

The participants were asked to assess the results of the qualitative exploration and the quantitative survey on information seeking and information source usage behavior of young professionals based on their own expectations and perceptions, critical aspects of the observed behavior and the poten-

tial of social software applications to serve as valuable sources of information in the workplace. In this matter, underlying value positions and management concerns were reflected based on the participants' experiences, perspectives and internal corporate guidelines. This led to the derivation of measures for leveraging the use of social software as a source of information in the workplace, which were categorized according to their focus and time horizon.

By moderating a structured discussion, recording the participants' contributions and confirming the observed with objective representatives from outside the organization, the workshop's results were gathered and interpreted.

4.4 Summary

This chapter has condensed the initial considerations about social software and its role as a source of information in the workplace to an overarching research problem in the field of INSU research. It has furthermore described the domain and setting as well as the methodical approach of an empirical study in order to come to answers for the set of research questions defined above. As Kelle (2008) has come to the conclusion that quantitative and qualitative research methods promise deeper and more holistic results when combined adequately (Ibid.: 261), the above mentioned methodical steps of this study were applied in order to gather rich and multi-faceted data.

The following chapters will present further details on the employed methods as well as their respective sample. The gathered results provide answers to the research questions defined in this chapter and allow for conclusive considerations regarding the design of the electronic information environment in regards to social software applications in the workplace of management consulting.

5 Modeling task-based information seeking of young professionals

This chapter presents the results of the qualitative exploration of the workplace environment of young professionals in management consulting. On the basis of the prior analysis of existing concepts in INSU research in chapter 3, a theoretical framework is developed that guides the analysis of the data gathered in the exploratory study through qualitative observation, semi-structured interviews and document analysis, in order to develop a context-specific model of task-based information seeking. The method of data collection and details about the sample of this study are described in section 5.1. As starting point of an inductive reasoning process, the scenarios of information seeking gathered in project visits and phone interviews within *Accenture Management Consulting* are then presented in section 1.1. They characterize the workplace environment of young professionals and common types of work tasks in rich detail in order to provide the reader with a better understanding of typical situations in the context of this thesis. Based on these insights into the daily work of young professionals, section 1.1 analyzes the observed phases of information seeking, influence factors and the existing information environment in the workplace. These findings are summarized and compared with previous concepts and findings in information seeking research. Together with the shortcomings of existing models of information seeking discussed in section 3.3.3, this leads to an adaptation of central concepts of INSU research according to the subject group of young professionals and the context of management consulting. As a result, section 1.1, presents a context-specific model of task-based information seeking, which best conceptualizes the observed phenomena and compensates for the identified shortcomings of prior research. These findings then serve as foundation for the development of working hypotheses regarding the information seeking behavior of young professionals in management consulting and the role of social software as a source of information. Section 1.1 summarizes the findings of this part of the study and highlights their implications for the development of the subsequent quantitative study.

5.1 Method and Sample

As described in section 4.3.1 the methodical approach of this doctoral dissertation is characterized by a combination of qualitative and quantitative methods. In order to gather a detailed understanding of the workplace context and common behavioral patterns of young professionals in management consulting, their information seeking behavior was explored by a combination of qualitative observation, semi-structured interviews and document analysis (see figure 25).

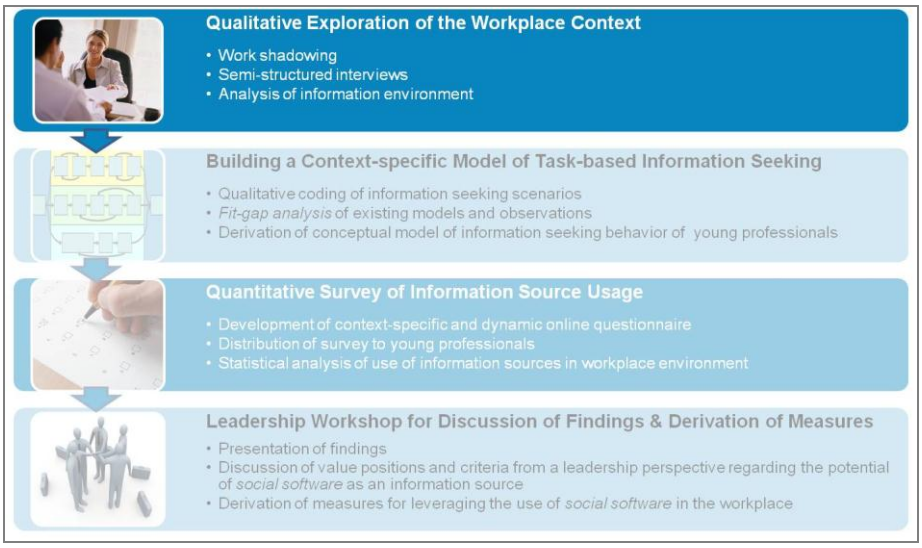


Figure 25 Qualitative exploration of the workplace context

One central methodical element of this exploration consisted of project visits and qualitative observations as described in chapter 4.3.1. Junior employees of the *Accenture Management Consulting* workforce in ASG were observed in their assigned work roles in project teams at the client site. In addition to these work shadowing sessions that resulted in a set of narrative summaries of information seeking scenarios, additional data was collected by asking the participants to recall critical incidents of task-based information seeking in a semi-structured interview (see appendix B) with the following adaptation of Choo et al.'s (2001) interview technique:

> "Please try to recall a recent instance in which you found information that helped you solve a problem or take adequate action within your project role.

> Would you please describe that incident for me in enough details so I can picture the situation?"

Requesting the participants to describe such situations, provided detailed scenarios of information seeking based on the participants' experiences. This proved to be even more useful than the timely and regionally limited observations, since it was not possible to visit all participants of the study in their project environment. As described in section 4.1, the subject group of young professionals was selected to be represented by employees from the geographical business units of *Accenture Management Consulting* ASG and North America. While it was possible to visit individuals of the former target group, work shadowing sessions could not be conducted with participants from the latter. Accordingly, the lack of direct observation was compensated by employing the mentioned technique via telephone. Table 7 summarizes procedure and criteria of the qualitative exploration and its instances of observation and interviews.

Table 7:
Summary of instances of qualitative exploration of the workplace context

	Accenture Management Consulting Austria, Switzerland, Germany	*Accenture Management Consulting* North America
qualitative observation	work shadowing on site	critical incidents via phone
semi-structured interviews	Each subject was interviewed allowing the observer to clarify certain actions, sources and terms used during the observation/critical incident. Open-ended questions allowed the subjects to reflect on the observed/critical incident and further describe their information seeking behavior and the role of social software as a source of information in the daily private and professional routine.	
number of projects / subjects	3 projects / 7 subjects	5 projects / 5 subjects
type of projects	Any client project across the various service lines of *Accenture Management Consulting*.	
project phase	Overall initial project phase or at least roll-on phase of respective subject	

As described, these field trips were used in order to conduct work shadowing sessions with subsequent semi-structured interviews of voluntary participants. The rich amount of gathered qualitative data was condensed by the

observer/interviewer in a set of 11 narrative summaries, which were validated with the subjects for their overall validity of common work task situations in the workplace of analysts and consultants. These scenarios describe the information seeking behavior of selected individuals and provide an overview of frequently observed situations, activities and used sources of information. The selection of these incidents was based on availability, significance for the defined research problem and representativeness for the domain and context of this study.

5.2 Scenarios of information seeking

In the following, the gathered incidents are described in '*narrative summaries*' (cf. Bartlett/Toms 2005) in order to convey a detailed impression of the tasks and procedures in the daily consulting project life of young professionals to the reader. Each incident is initially introduced by the point of departure of the respective project and personal context of the participant. Then the specific observed or interviewed information seeking scenario is described. The segmentation of the different phases of each incident was conducted by the author and later validated with the observed subjects.

Incident 1: 'Getting an overview'

Point of departure

After having received her master's degree in human resource management Jessica[42] joined the firm's HR consulting workforce a year ago. As part of this group she received initial core trainings, teaching her the fundamentals of business consulting, as well as the corporate methods, tools and assets used on typical project engagements. She was then assigned to a pool of junior employees eligible for any suitable role on project teams within the HR consulting department. She currently is staffed to a project at a client of the energy industry. Together with six other colleagues she works at the client site on a training development project as part of the client's global corporate

42 The names of the observed employees described in the following cases of information seeking have been altered in order to guarantee anonymity.

talent development program. It is the overall goal of this project to roll out a corporate university program with blended learning offers for each workforce. Jessica specifically is assigned to developing training material for the courses directed at the HR workforce of the client. Her project role accordingly is called 'training developer' and she works together with one peer colleague, who has been assigned to this client for a longer period of time already. Together with her colleague she reports to a workstream lead, who acts as counterpart to the client. She is relatively new to the project and has neither worked for this client before nor for any other company of the energy industry. As newcomer to the project, she needs to learn all about this industry, the client, his current situation, the project her firm has sold and her specific role and tasks. While working through existing material and information, she is asked to document her findings in an overview presentation. Since many external trainers, client contacts and colleagues from other projects or groups ask for such information, she shall update the existing material and thus create an overview of the current project for this audience. Jessica figures that her information need matches this audience and therefore decides to document everything she will be able to find.

Information seeking scenario

Define information need and evaluate initial situation

As described above, Jessica is fairly new to industry, client and project. She therefore does not know a lot of the things required for the above mentioned overview information. As a first step, she writes down the questions, she herself needs to answer and furthermore imagines, what other people would need to know to better understand the project and its context. So, first of all, she takes a look at the existing information material from the forerunner client project. Since this project led to the current project, she figured she might make use of a large amount of material gathered before. But she soon realizes that her (and therefore the audience's) information need would not be met by the existing material, since project scope, structure and content have changed in many ways and there is no general information on the client and industry.

First orientation: identify information sources and links

In order to get a first understanding of the energy market and the client, Jessica opens the *Internet Explorer* visits the company's website and browses its intranet pages. There she is able to find general information on the corporate

group, its organization and products. Furthermore she learns about current hot topics and existing projects. She also uses the *Google* Search engine and *Wikipedia* to seek more general information regarding the energy market, competitors, products, mechanisms and terminology. She saves the links and copies and pastes some of the most valuable pieces of information into a blank presentation. For more detailed information regarding the project, she asks her colleagues what has been done before and who might know more about it. Of course, her colleagues on the project are able to provide her with input. Furthermore, they refer to other colleagues who might be of help. Jessica herself remembers some colleagues as well who have been presenting their part of the project in previous phone conferences or brownbag sessions (informal lunch session with short presentations). But before she contacts anyone other than the colleagues in the room, she takes a step back and tries to structure her request. This helps her to have an overview of what infomation she will further need to seek and what she will use it for, once retrieved.

Gather information

Based on the references from her colleagues and her own contacts, she starts to contact various colleagues. In order to find out how to contact them and what they might contribute, she opens the *Internet Explorer* and visits the internal *People Pages*. There, each employee is represented by a profile page with contact information, a short biography and further information regarding skills, interests and previous project experience. Furthermore, she starts to visit the internal *Knowledge Exchange* Portal and external web pages, she had bookmarked in her first orientation on *Google* and *Wikipedia*. By these means she gathers many pieces of information of various types: pictures, text documents, presentations, audio files and videos. The largest amount of information thereby comes from her colleagues, sending her *PowerPoint* presentations of work package overviews, regular meeting/status updates, conceptual training material and other deliverables of her project and other related projects.

Evaluate information

Jessica then has to evaluate which of these information objects may be useful for her. In order to judge the material, she needs to decide what it is she wants to say in her presentation and how she is going to visualize it. She needs to take into account certain restrictions and standards, defined by templates and manuals of the client and/or the project.

Create draft: merge information and add findings

She then is able to create a first draft version of the deliverable. This, of course, consists of previously created material of her peer and senior colleagues on the one hand. But, on the other hand, is also refined and extended by the information gathered from the various sources and findings Jessica was able to extract herself. Based on these sources, she is able to document answers to her own questions and thereby create an overview presentation for future use and distribution to other colleagues and clients.

Discuss and refine

Before handing in her results, she consults her peer colleague to discuss the draft. In discussion with this more experienced colleague she is able to verify whether structure and visualization are adequate and self-explaining and whether the provided information is correct compared with her previous experience.

Finalize

With this done, she finalizes the presentation by making final corrections and sends the deliverable to her supervisor.

Incident 2: 'The Indian asset'

Point of departure

After three months on the project, Jessica feels more comfortable with her project role, the client and project context. She works quite independently and is guided by her peer colleague, who usually defines her work packages and is her first report level. Her supervisor then coordinates the deliverables with the client and manages change requests. One morning Jessica opens her e-mail inbox and finds a request from her senior executive asking her to contribute to an overview presentation for his meeting with a member of the board of a prospective client. This presentation shall summarize their activities with the client as well as explain the concepts, tools and methods her firm has developed over time to offer this type of consulting work to other prospective clients. She receives this request along with some guiding comments through a chain of colleagues – down from the senior executive passed on by a senior manger to her supervisor and then forwarded to her. Jessica realizes that she will need to gather various pieces of information in order to

be able to answer to this request and put together an appropriate presentation regarding not only her activities but the overall asset developed by various colleagues.

Information seeking scenario

Clarify request and information need

The first step for Jessica is to analyze exactly what has been requested. She reads the e-mail another time in order to understand the posed information need. For the further understanding of the expected deliverable, she can also rely on previous experience with such presentations and requests. But she soon realizes that she will not be able to meet the inquiry based on her existing knowledge and experience.

Gather existing material

So she first starts to gather an overview of what material exists within the project, which might help handling the request. Therefore she consults her own file archive of presentations and training material. This is stored not only on her PC but also on the team/project server. So she opens the *Internet Explorer* and enters the address of the project *SharePoint*. From these two information sources she is able to retrieve a variety of presentations regarding the activities at the current client. But for a more general overview of all assets of the entire consulting workforce, she needs to seek further. She asks her peer supervisor (on the phone) for advice and is forwarded a document from another project, where a corporate academy has been developed to train a client's marketing and sales workforce. Her peer colleague (in the room) also mentions that she has heard from a group of colleagues from the office in Bombay, which is currently working on an offering specifically considered with corporate academies for HR workforces. These colleagues have summarized the main findings from previous projects and research and asked her and their supervisor for revision of the material only days before. Jessica remembers that she had received this presentation as well and opens it along with the previously gathered material.

Evaluate relevance

She then scans through the various slides and evaluates, which of these might be relevant for the mentioned executive meeting. Since the exact nature of the meeting and information requested from her still remains somewhat un-

clear, Jessica would like to contact the senior manager, who is preparing this meeting, in order to ask her for further details. But since she doesn't know this colleague very well, she decides to send her peer colleague a meeting request to discuss her considerations with her. Regardless of this vagueness, she realizes that the presentation she received from her supervisor will be of no use. The overview presentation of their project and the material from Bombay seem most promising to her.

Merge and adapt

Jessica starts to merge the existing presentations by selecting the most informative slides from each deck and copying it into a new presentation. This way she creates a draft, where she may retrace the storyline and adapt the material with regard to the prospective audience and context. This also includes translating the Indian presentation into German. While adapting and translating she opens the *Internet Explorer* to visit http://dict.leo.org. There she finds translations from English to German and in some cases reads through the discussion forum regarding the appropriate translation for certain terms. Other than translating the existing slides, she adds further information based on her own experience and the project context.

Evaluate with colleagues

With the first draft of the information collection she turns to her peer colleague for feedback. Both discuss again the exact information need of the senior executive and his client counterpart. This leads to concerns that the scope of the presentation might be inadequate. They agree to include further information from the material of their colleagues in Bombay. For the use of this material, they will have to contact these colleagues and ask for any confidentiality restrictions. Furthermore, they decide to present their own project in fewer slides.

Finalize and send

Jessica does not have the time to contact her Indian colleagues regarding usage restrictions. She decides to go to the internal *Knowledge Exchange* of her company by opening the *Internet Explorer* and entering the respective URL. She uses the search engine to search for the archived version of the material from her colleagues. She is able to locate the same document, she had been sent from her colleagues, on the exchange server. All material in this portal is tagged with metadata regarding the authors, content and usage

restrictions. Jessica discovers that the information is approved for external usage. She finally checks her presentation and sends it to the senior manager, who prepares the material for the meeting of the senior executive and the board member.

Incident 3: 'Selecting the right sources'

Point of departure

After having received her master's degree in organizational psychology Martha joined the firm's management consulting workforce a little over a year ago. As part of this group she received initial core trainings, teaching her the fundamentals of business consulting, as well as the corporate methods, tools and assets used on typical project engagements. She was then assigned to a pool of junior employees eligible for any suitable role on project teams within the HR consulting department. She currently is staffed to a project at a client of the chemical industry in France and Switzerland. Together with 20 other colleagues she works at the client site on a training development project as part of the client's global *SAP* rollout. It is the overall goal of this project to align the IT architecture and the organization's process landscape with its organizational structure and strategy. Martha specifically is assigned to coordinate the graphic design with an external media agency. As "graphic coordinator" she is responsible for managing the demands from her colleagues and signing off the deliverables from the agency. Thus, she provides her colleagues with the required icons, images and short media clips for the production of the respective training material. She, therefore, communicates with the media agency on a daily basis and distributes the delivered items to her colleagues via the internal project *SharePoint* site. In order to fulfill her project role, Martha needs to have a deep understanding of *SAP* and its specific functions. Even though she has used *SAP* in an internship years before, she realizes that her knowledge is very superficial and needs to be deepened.

Information seeking scenario

Gather an overview of existing training material

As Martha was aware, her company offers its employees a rich online training curriculum. As a first step to deepen her knowledge regarding *SAP*, she turned to this internal web portal to gather an overview of the existing training material it provided. On the homepage of this portal she used the search

function to search for all *SAP*-related courses. The result list of this search revealed a wide range of courses with *SAP*-related content. Some were classroom trainings one could book online, some were virtual classroom trainings or webinars and some were web-based trainings (WBT).

First selection of sources

Martha knew she would have to concentrate on web-based trainings, since there was neither the budget nor the time for a classroom training or webinar. The list of *SAP* WBTs, however, was quite extensive. In order to get a better understanding of course content and target group, she browsed through the various abstracts provided for each course. In some cases, Martha even started the WBT and clicked through the introductory chapter to get a better idea of its relevance and usefulness for her. Each training course page also showed comments and ratings of her colleagues, which had taken the respective course. Based on this additional information she was able to exclude some of the courses as they were too specialized or referred to *SAP* modules not relevant for her project. Regardless of the meta-information provided by the system, Martha was not able to evaluate which training course would serve her information needs best.

Refer to experienced colleagues to narrow down relevant sources

Thus, she decided to turn to a colleague, who, as she knew, had been on *SAP* projects before and would be able to help her identify the relevant training courses. She sent an e-mail to her peer describing her current project situation and information need. Only few hours later, she received a list of recommended trainings. In her e-mail, her colleague explained her which WBT was the best introductory training and also which information sources were quite useful for further questions and ad-hoc search. Furthermore, he attached a *PowerPoint* presentation, which gave an instant overview of the program and its core functions.

Extract information

That way Martha was able to focus on one main online training course to extract general information on *SAP*. She then also read through the *PowerPoint* presentation and was able to gather further insights into her project context and the work of her colleagues. Finally, she worked herself through the link list provided by her peer. The information sources mentioned therein proved to be most helpful, since she was able to refer to an online *SAP* glos-

sary, an *SAP* Forum and a list of most frequently asked questions. Thus, Martha was able to extract vital information from the identified sources and satisfy her initial information need for the proper execution of her project role.

Specify requests to colleagues

Finally, she could turn to the colleagues on her project and formulate specific questions based on the information, she had previously gathered.

Incident 4: '*Just google it*'

Point of departure

After having received his master's degree in psychology and various internships in the field of consulting Marc joined the firm's management consulting workforce a little over half a year ago. As part of this group he received initial core trainings, teaching her the fundamentals of business consulting, as well as the corporate methods, tools and assets used on typical project engagements. He was then assigned to a pool of junior employees eligible for any suitable role on project teams within the HR consulting department. Marc currently is staffed to a project at a client of the energy industry in Germany. Together with six other colleagues he works at the client site on a training development project as part of the client's global corporate talent development program. It is the overall goal of this project to roll out a corporate university program with blended learning offers for each workforce. Marc specifically is assigned to developing training material for the courses directed at the marketing and sales workforce of the client. His project role accordingly is called 'training developer' and he works together with one peer colleague. Together with his colleague he reports to a workstream lead, who acts as counterpart to the client. On his first day at the project, he is briefed by his supervisor on the current status, his work package and the information sources available. Marc is familiar with the theoretical background of training development and spends his first days reading through the project briefing and talking to his colleagues in order to get a better idea of his role. He feels quite comfortable with his tasks and soon is asked to start working on his first training course.

Information seeking scenario

Understand task and context

Confronted with his first self dependent task, Marc realizes, he needs to understand the details of this task and the context of the training module he is assigned to. He contacts his colleagues, who have been working on this project for a longer period of time and asks them about their general approach to develop training material. They are able to provide him with insights into the overall project guidelines and proceedings. Their description of their tasks and workflow helps him understand the context of his work and how to approach his first training course.

Gather overview of existing information sources

In order to start the conceptual work, Marc explicitly asks them for existing project documentation, standard material and a list of relevant literature and further information sources. He is provided with all the required material. Working through the given information sources, he is able to gather a solid overview of the work aids he has at hand for his task of developing a training course for the sales and marketing workforce.

Identify information need/gap

However, Marc realizes that he needs further information regarding the concepts of marketing and sales. The existing information sources only relate to methodical and project-related concepts. Since his training course contains a large amount of technical terms, he has not heard of before, he will need to understand the basic definitions and conceptual frameworks himself, before he is able to design the training material for his target group accordingly. In specific, he needs further information regarding the concepts ‘cost to sell’ and ‘cost to serve’, which are a fundamental element of his marketing and sales training module.

Refer to internal Knowledge Exchange

Since neither his colleagues nor the existing material is of any help, he opens the *Internet Explorer* and consults the company’s internal *Knowledge Exchange*. This intranet portal contains two main types of content: topic contributions and pages. Contributions are the deliverables that employees submit. They are tagged with metadata and classified by taxonomy. Topic pages, managed by content maintainers, highlight top contributions and feature

other relevant information about a topic. Since most of the information provided by this portal is either client-specific or on a higher level of detail, Marc was not able to find the general definitions he was looking for.

Conduct internet search

He decides to search external sources for more general information and visits *Google.com*. Marc enters the following query: "cost to sell". The list of results is very long and he soon realizes that the first items are not relevant for him. He navigates through the following result pages and finds a PDF document from a competing consulting firm. He opens it and discovers a two-page article on the concepts he was looking for.

Extract information

On first sight, the document appeared quite helpful and so Marc decides to print it out and read through it in more detail. The concepts are well explained and visualized. He highlights the most important sections and decides to use this information as input for the training material.

Evaluate with colleagues

Before making use of this document, however, Marc contacts his peer colleague. They both read through the article together and discuss whether it may be used for their purposes. His colleague holds that the definitions and visualizations seem correct and appropriate. Furthermore, they agree that the document proclaims no copyright restrictions, which would have prohibited further usage.

Adapt and integrate

Marc and his colleague agree to use this information as a foundation for his training course. Accordingly, he adds it to the existing information material and adapts the definitions and visualizations to match project standards and guidelines. He then integrates the information in his first draft of training material.

Incident 5: '*Dead end*'

Point of departure

After having received her master's degree in international business studies Katharina joined the firm's management consulting workforce nine months

ago. As part of this group she received initial core trainings, teaching her the fundamentals of business consulting, as well as the corporate methods, tools and assets used on typical project engagements. She was then assigned to a pool of junior employees eligible for any suitable role on project teams within the HR consulting department. After her first project for a client of the energy industry, where her firm implemented a professional skills management in the HR landscape of the client's global organization, she is approached by a senior executive and asked to help create a project sales offer as a reply to a client's request for proposal (RFP). This RFP seems to ask for the external support for a project, which sounds very similar to her previous project. It is the goal of the prospective client to introduce a professional skills management to his organization by setting up the respective processes, aligning the organizational structure accordingly and training his HR workforce and management to implement this talent strategy. Katharina is asked to support the senior executive and his team in developing a sales deck, defining the firm's approach and proposal to this prospective project. Therein, Katharina is not involved in the conceptual development of the presentation. However, she is asked to seek further credentials of previous projects and clients, which may suit as references and proof of her firm's expertise in the matter.

Information seeking scenario

Define information need

Based on the draft presentation for the project proposal and the directions of her supervisor, Katharina is able to narrow down her information need. She was asked to gather all existing internal information on previous projects in the field of 'professional skills management', including existing project documentations and client references. This information shall be used to document her firm's capabilities in the field of the RFP from the prospective client.

Select the most promising information source

Katharina knows – based on her initial core trainings and her first project contribution – that all employees are to document project experience and credentials on the corporate *Knowledge Exchange* platform. When asked by her supervisor to gather the above mentioned information, she decides to visit this internal web portal. This decision is based on her training experiences,

her supervisor's advice and the fact that she is not aware of any colleague who might have worked on such a project before. Since she does not know any colleagues with the desired experience personally, she needs to consult the internal *Knowledge Exchange*.

Conduct search

Katharina conducts various searches on the internal portal with queries such as: "professional skills management" (Q1), "skills management" (Q2) and "credential skills management" (Q3).

Gather results and collect material

She is provided with lists of matching results. In addition to the retrieved documents listed by relevance, she receives an overview of the type of documents that were found in the database. Accordingly, she can filter the results so that she only receives project documentations and credential presentations. In addition to item type, she may also apply filters such as 'languages', 'clients', 'file type', 'offerings', 'contact' and 'date'. That way Katharina is able to narrow down her search to few seemingly relevant documents and saves them to her desktop.

Evaluate information content with colleagues

Once downloaded, she opens the respective document and skims through its content. As Katharina proceeds through the various pieces of information, she realizes that the material is either too outdated or not specific enough in order to use it for the proposal they are currently working on. Most of the time, the documents reveal that the responsible colleagues were engaged in a 'skills management' project, but it did not contain the exact type and granularity of information, Katharina and her team needed for the proposal. She discusses her thoughts with her colleagues and is supported in her opinion.

Personally inquire further details from originators

Nevertheless, Katharina is sure that a large share of the projects she found on the *Knowledge Exchange* is of relevance to her work. She therefore consults the author information of each document and decides to send each originator an e-mail. Katharina asks 12 colleagues to provide her with further information regarding the mentioned previous projects in the field of 'professional skills management'. She specifically asks for a one slide summary (*Power-*

Point), which may be used as a reference for their current project proposal at a prospective client.

Gather replies and evaluate feedback

Even though she receives immediate replies from two colleagues, the overall results Katharina achieves with this request are quite disillusioning. Within 14 days, she only receives replies from four colleagues. Some of the colleagues she contacted were on vacation; others had already left the firm or were not really involved in the mentioned projects themselves.

Dead end

Based on her search on the internal *Knowledge Exchange* and the personal inquiries she had sent out via e-mail, Katharina is not able to gather any further references from previous projects. With the information sources she has at hand, she cannot provide the information her supervisor had asked her for.

Incident 6: '*Deep dive*'

Point of departure

After having received her Master of Science Business Honors degree in international management Laura joined the firm's management consulting workforce a little over a year ago. As part of this group she received initial core trainings, teaching her the fundamentals of business consulting, as well as the corporate methods, tools and assets used on typical project engagements. She was then assigned to a pool of junior employees eligible for any suitable role on project teams within the 'Supply Chain Management' consulting department. She currently is staffed to a project at a client of the chemical industry in Germany. This project is part of a global program aiming at the optimization of the supply chain process landscape, IT system architecture and organizational structure of the client. Over a longer period of time the management consulting and technology services workforce set up this program together with the client, manage the program office and support distinctive management levels of the client in various sub-projects and work packages. The current project, on which Laura rolled on four months ago, is concerned with the processes of global order fulfillment and export. Together with about 10 – mainly senior – colleagues her firm supports the client in the conceptual design of global to-be processes, detailed business processes and

functional design and the creation of functional specifications as well as a detailed initial business case. As a junior employee Laura is assigned to the operative support of the client contacts. Her project role is called 'value architect & process designer' since she has the task to develop a bottom-up business case linking key performance indicators (KPI) to the business result of each process redesign measure and furthermore is responsible for the operative support of the work package concerned with designing the process of global export documents and bill of lading. After a week of orientation, where Laura got to know the client, the global program and the project's scope as well as her role description, she started her work on the business case.

Information seeking scenario

First orientation and development of approach

In order to develop the business case, Laura needs to gain a deeper understanding of the task and develop an approach on how to proceed. On her previous project, she gained first experience and knew in general what the expected outcome of this task should look like. However, she soon realizes that this business case will be very complex since there is a large amount of work packages and activities influencing the business outcome of the project, which are highly distributed across business units and geographies. She, therefore, develops a four step approach to her task. First she plans to gather all project activities and measures on work package level that will have an impact on the client's profit and loss (P/L) statement. Based on this information she will identify where exactly these benefit levers will have an impact. Then Laura plans to interview the responsible client contacts in order to evaluate the degree of impact of these benefit levers. Finally, she wants to collect the respective data on operative level in order to gather the exact impact, e.g., amount of time spared and amount of reduced errors, in order to forecast the estimated return of investment for the entire span of project activities.

Identification of information need

Gathering a list of all activities on work package level does not present a complex task for Laura. She designs an *MS Excel* template, sends it to her colleagues and client counterparts involved in each work package and asks them to fill in the required information for her. The next step, however,

proves to be more difficult and Laura realizes that she will need to seek further information in order to be able to identify where the respective activity will add to the P/L statement of the client. She feels quite comfortable with this matter in general, but is not familiar with the specific structure and logic of P/L statements in the chemical industry. She needs to dive deeper into this topic of accounting standards and develop the competence to understand and analyze the client's profit and loss account.

Gather overview of existing information

First of all, Laura asks her team members and client counterparts whether there is the required information available. She finds out that there is no preexisting material she might use right away, since none of her team members and supervisors have worked on this topic before. One of her clients, however, suggests her to contact an employee of the Controlling department. He would be able to explain to her the internal accounting standards, cost centers, service cost centers, consolidation guidelines and other standards. She immediately arranges for a meeting with this contact, but realizes that she will need to prepare and develop a first understanding of the industry traits.

Search for further information sources

Laura turns to the e-library of her former university and searches for general keywords such as "accounting standards", "chemical industry" and "p/l statement" in order to get an overview of relevant journals, authors and current topics. She also takes a look at her university folders with the material of accounting classes. Browsing through the internal *MyLearning* platform of her firm, she cannot find relevant courses with the required granularity of information. Finally, she realizes that her sister is quite an expert in this topic and decides to meet with her as well.

Extract information

Having collected such a large amount of information sources, Laura starts to extract relevant material from them. Via a magazine she discovered in the e-library, she has found a case book on "Valuation" from *McKinsey* and purchases it. It contains all the relevant basics on how to measure and manage the value of companies. Reading through it, she also consults her notes from the university and gathers a good overview of relevant aspects of her current task.

Discuss and refine

Based on this information she is able to discuss her findings with her sister. She is able to explain Laura some open questions in more detail and thus prepare her well for the meeting with the controller. Finally, Laura has a 30-minute meeting with the client contact of the Controlling department and finds out more about the specifics of the client's accounting standards. He also provides her with internal documentation for further study and future reference.

Reflect and apply

Having consulted this variety of information sources, Laura feels well prepared to analyze the client's P/L statement. She is now able to identify where each process redesign measure will impact the client's profit and loss account and thus proceeds with the design of the business case.

Incident 7: 'Identifying responsibilities and standards'

Point of departure

After having received his undergraduate degree in marketing and international business Mike joined the firm's management consulting workforce one and a half years ago. As part of this group he received initial core trainings, teaching her the fundamentals of business consulting, as well as the corporate methods, tools and assets used on typical project engagements. He was then assigned to a pool of junior employees eligible for any suitable role on project teams within the 'Talent Management and Organization Performance' consulting department. Currently Mike is staffed to a consulting project at a major computer technology corporation, where he is assigned to the role of a communication officer. The project itself is a very large training initiative designed and rolled-out by a large team of colleagues. It is his role to coordinate the various training modules and sessions and set up regular communication to the client and all affected personnel. In the course of his work, his colleagues have built a new training module and now need to inform the entire target group about the availability of a new training session. Mike's supervisor informs him that this communication is needed at short notice and asks him to guarantee that all employees were informed in time. Since he has not done such a global communication before, he does not know how to approach this task.

Information seeking scenario

Understand task and specify information need

First of all, Mike tries to gather further information from his colleagues and client counterparts. He asks them how such a message is usually transmitted and who needs to be contacted in order to follow the corporate standards. He is told that there exists a standardized process, where certain employees need to review and approve the communication before a weekly deadline. His contacts know that there existed a certain corporate channel with specific requirements regarding layout, review and deadlines for such communication, but none of them has detailed information on how to approach this task. He realizes that sending out this message would take more than writing a text and pushing a button. He needs to understand the corporate guidelines of his client in order to successfully perform his task.

Identify valuable information sources and responsible contacts

Mike decides to turn to the corporate intranet of the client in order to find further information on who to contact and how to proceed. Furthermore he hopes to find a standardized template, which provides the correct layout for his news message. He discovers that there exists an internal communications team, which coordinates and approves all messages to the employees from external partners. With the contact information from the intranet, he sets up a meeting with the responsible contact in order to explain his intention and close the gap in his knowledge.

Gather information from responsible contacts

In the meeting with the client's communication team, Mike finds out that indeed a complex process for internal messages was in place. This had become necessary since previous communications did not meet the client's requirements. In some cases wrong channels and layouts for messages have been used and thus caused misunderstandings and irritations. The discussion with the communications team helps Mike clarify a lot of open questions, especially regarding the approval process for such messages. The exact requirements regarding language and layout for a successful and timely approval of his message remain unclear to him.

Clarify open issues

He returns to his office and contacts his colleagues from another project at the same client. He calls them to explain his concerns that his urgent message would not be approved and accordingly fail to reach the target group in time – as it has been requested from his supervisor. Since they have previously sent out similar notices, they are able to give him some advice on certain terminology and other aspects to bear in mind when writing his message.

Consolidate findings

Finally, Mike consolidates all these pieces of information and creates a newsletter, which follows the client's standards. He is now aware that he needs to have this draft reviewed and approved by the client's communications team by the end of the day. Furthermore, the project lead also needs to sign it off within two days in order to finally deliver it via the adequate internal mailing list.

Evaluate and finalize

Before sending out his draft, however, Mike discusses it one final time with his supervisor. They agree on final version and send it out for review.

Incident 8: 'Getting to know new domains'

Point of departure

After successfully delivering the training project to the client, Mike's team finishes this engagement and he is asked to take over a new role at a different client. He shall join a project at a client of the health insurance industry. His firm was asked to consult this client regarding their customer relationship management and identify ways to enhance service quality and customer satisfaction. A first team has conducted a strategic analysis of the client's current activities and weaknesses in this field and identified large potential for improvement by setting up standardized CRM processes and introducing a new information management system. The client has agreed to launch a large scale project in order to introduce *Siebel CRM* into the IT infrastructure and establish the proposed processes. Now that the first modules of the system are in place and the global launch is approaching, Mike and other colleagues are staffed to the project in order to set up required training modules for the enablement of the client's personnel to successfully use the new system. Ac-

cordingly, it is his role on this project to develop training material, which may be used in classroom and web-based trainings on part of the client.

Information seeking scenario

Understand task and identify information need

Prior to his first day at the project, Marc starts preparing for his new role. First of all he feels the need to understand in detail what will be requested of him and what he will need to know in order to perform his role. He contacts his supervisor and clarifies first open questions regarding the project engagement, current situation, client details and aspects of his role. Thanks to his previous project experience Marc is familiar with the activities of training design and change enablement on such a project. However, he has never been at a client in the healthcare industry and is not familiar with the *Siebel CRM* system. He realizes that he needs to quickly gain knowledge in both domains in order to be able to perform his task. He agrees with his supervisor to take first steps in order to familiarize with industry and tool and makes sure to arrange a second meeting with him, where he will be able to get back to him and reassure he is on the right track.

Gather overview of field of interest and specify information need

For a first overview of relevant terms, industry specifics and a general description of the CRM tool, Marc browses the web using *Google* and *Wikipedia*. This way he gathers general information on the client (via the client's homepage), *Siebel* (via *Wikipedia*) and overall characteristics of the healthcare industry (e.g., via *Wikipedia*, *Google news*). He is now more aware of the field he will be working in and able to formulate more specific information needs regarding his job role and upcoming tasks.

Ask colleagues for more specific information sources

Marc then turns to his colleagues and supervisor to ask for more specific information on the tool and the healthcare industry. His supervisor provides him with a link list of relevant information sources on the industry. While his colleagues send him a set of *PowerPoint* slide decks on *Siebel*, its infrastructure, modules and overall functionality.

Extract information

This large amount of relevant information sources proves to be very helpful for Marc. He works through the various documents and websites and deepens his knowledge on the healthcare industry and the CRM tool.

Deepen knowledge with training material

Finally he refers to the internal learning management system and finds further training modules on industry specifics and is able to sign up for a 1 hour classroom-based training for *Siebel*.

Finalize and continuously clarify questions

This proceeding enabled Marc to quickly get to know the details of the project context and essential information for his project role. He starts his work on the project and is given frequent 'touch points' to further clarify open questions. These are regular team meetings, where colleagues may ask and discuss various problems or questions.

Incident 9: '*Where to start*'

Point of departure

After having received her undergraduate degree in economics Gwen joined the firm's management consulting workforce one year ago. As part of this group she received initial core trainings, teaching her the fundamentals of business consulting, as well as the corporate methods, tools and assets used on typical project engagements. She was then assigned to a pool of junior employees eligible for any suitable role on project teams within the 'Talent Management and Organization Performance' consulting department. In the course of a large financial information system implementation at a client of the utility industry, Gwen is asked to join the project team in order to develop training material for the roll-out of the system. While her colleagues are mainly concerned with the development of functional designs, system requirements, business planning processes and other functional work, it is her role to develop the respective training modules for the enablement of the client's workforce.

Information seeking scenario

Identify information need

Gwen is well aware of her task and what is the expected deliverable of her work since the project uses a standard methodology approach, which is well documented regarding roles, tasks and responsibilities. But since it is her first project role, she does not know where to start and how to map things out. She realizes that she needs a lot of guidance on how to approach her first task of creating the training material for a certain module of the new system.

Ask supervisor and peers for first guidance

Instead of directly addressing the client she chooses to contact her supervisor and ask him for help. Her supervisor understands this and recommends her to contact the change management development team and other project teams, which might be able to provide her with further guidance. With a load of questions she first turns to her team members in order to find out where to look for further information on her task and ways to approach it. Since they have already been on the project prior to her they are able to point her to the internal *SharePoint* site, where she may find the already existing training material and further documents of the project design phase.

Gather information from recommended source

Based on these recommendations, Gwen turns to the project intranet and retrieves the various design documents. Furthermore she receives testing documents from the testing team, which allow her a deeper understanding of the various system functionalities.

Build up technical know-how

Before extracting the information from these documents, however, she is able to sign up for a training course on the training development tool itself. This training explains her how to actually develop the material with the respective tool.

Extract information

Having understood how to use the tool for developing training material, she turns to the documents she has retrieved from the information sources her colleagues have recommended her. She then extracts the information on the newly implemented information system from the design documents and is

able to develop a first approach of how to teach the new functionalities to the target audience based on examples of previous training material.

Verify understanding and present approach

With this she now feels comfortable to turn to the client and discuss with him whether she has understood the system correctly and whether the approach to her first training module is going in the right direction.

Incident 10: 'Understand foreign concepts and interrelations'

Point of departure

After having received her undergraduate degree in psychological sciences Hanna joined the firm's management consulting workforce one year ago. As part of this group she received initial core trainings, teaching her the fundamentals of business consulting, as well as the corporate methods, tools and assets used on typical project engagements. She was then assigned to a pool of junior employees eligible for any suitable role on project teams within the 'Talent Management and Organization Performance' consulting department. As one of her first projects, Hanna is assigned to a business system implementation project at a client of the pulp mill industry. In the course of this large scale project a new company information system will be introduced, which will support all relevant business processes with the relevant operative and strategic information. Since such an implementation includes a large amount of system and process changes, a team of consultants has been asked to develop a concept on how to enable the client's workforce in using the new system and aligning with the new business processes. Hanna is therefore assigned to the role of a conceptual training design developer and asked to create training material on *SAP* and its relevance for the sheeting process. She realizes that even though she has quite sufficient knowledge of training development and the system itself, but cannot apply this knowledge without the respective industry knowledge on paper production in general and the converting process in specific.

Information seeking scenario

Understand task and identify information need

In order to gather the required information, Hanna first of all tries to identify the scope of her work package and the affected client process steps she will

have to include in her concept. Her supervisor tells her more about her task and responsibility but since she does not know anything about the operative procedures of the client's business, she is not able make a rough draft of her training concept. She realizes she would need further understanding of the operative processes of paper production and how they played into *SAP* in order to develop the training concept.

Evaluate relevant information sources

First of all she turns to her colleagues in order to find out whether anyone had done something alike and would be able to help her. Since the industry is quite specific, there does not seem to exist previous experience and subject matter expertise in her proximate surrounding. She knows that her client is very familiar with the topic but does not want to approach him with questions on the very basic level. She decides to arrange a meeting with her client counterpart but to research the basic information beforehand in order to create a first overview of her approach.

Look for internal expertise and experiences

Since she is not able to get any support from her colleagues, she turns to the internal *Knowledge Exchange* platform of her firm, where all consulting project engagements are documented. She uses the search function of this portal and is able to retrieve various documents on the pulp mill industry and previous projects at such clients. These documents include deliverables of these projects as well as presentations documenting the project scope and implementation.

Specify information need

Scanning through the documents, however, Hanna realizes that the objects retrieved from this information source are not very valuable to her since they did not provide the type of information she is looking for. It was too technical on the one hand and not detailed enough on the other. She realizes that she is looking for more general information on the industry, which still provided her with a high level of detail on the business processes at a pulp mill.

Choose information system and conduct search

Thus, Hanna hopes to find more relevant information on the web. She uses the *Google* search engine to seek information on the converting process, the sheeting and storing of paper. This information would help her identify how

these tasks proceed and will be tracked in the *SAP* system. Her web search returns a large variety of information sources, which she shortly evaluates. She is able to find relevant websites with further information on the paper production process (e.g., wisegeek.com, sayid.net) as well as gather documents from *Google Scholar* on a more detailed level.

Extract information and condense it

Hanna works through the different documents and websites and condenses it to a conceptual overview of the proceedings at the client and the interplay with a corporate information system. She can now identify what she needs to include into her work package and develop an approach for the training design.

Present and evaluate

With this rough concept and her basic understanding of the pulp mill industry she feels now comfortable to approach her client counterpart. With him she is able to fill the gaps and validate the gathered information as well as agree on the further proceeding and concept.

Incident 11: 'Iterative market research'

Point of departure

After her project at the client of the pulp mill industry is finished and delivered, Hanna returns to her home office. There she is asked to support a senior executive and his team in developing a proposal for a prospective client of the automotive industry. She is given the role of a business development research analyst and receives various requests from her more senior colleagues to seek certain data, which is required for the proposal development. One day one of the senior project members comes up to her and asks her to provide him with an analysis of the smartphone market. In order to lay out the value proposition and estimated reach of the project, her colleagues need to be able to draw a picture of the syndication of such devices in the client's region.

Information seeking scenario

Specify information need

In a discussion with her supervisor Hanna further clarifies what is requested from here. She understands that her team needs to know what the size of the smartphone market is and how many devices there are in a certain region. As a first step Hanna starts a general web search in order to get a first understanding of what devices are considered to be smartphones and thus further specify her information need.

Gather first set of information

Then she is able to seek the information requested from her colleagues. She visits the websites of such research databases as Forrester and Gartner, since she knows that these sources are known to provide market studies and statistics. She searches for any document related to smartphones and is able to retrieve a set of information objects. These include articles or factual data in the form of US statistics. Hanna collects all this information and saves it to her computer.

Extract information

She closes the *Internet Explorer* and starts reading the articles and extracting information from the gathered data. While doing this she summarizes the information and consolidates it.

Present and evaluate

Thus she is able to present the gathered information to her supervisor and evaluate with him what of this is useful to the proposal her colleagues are working on. In this discussion further questions arise as to the different functionalities of smartphones and their benchmarks.

Identify new information need

With this newly identified information need Hanna returns to her previously retrieved documents. She realizes that she will need further information and continues her web search.

Collect and extract further information

She is able to gather further documents from the above mentioned information sources, which promise to close the identified gaps. Extracting the information she updates her consolidated summary of findings.

Present and evaluate (2nd round)

Hanna and her supervisor sit together and evaluate the status of their research anew. Since the development of the proposal has taken another direction by now, they identify further questions which cannot be answered based on the data gathered so far.

Repeat and refine

Hanna and her colleagues repeat and refine this process until she has gathered sufficient market statistics, which build the foundation for the statements made in the project proposal to the client.

5.3 Analysis of findings and definition of central INSU concepts

Reading through the above described scenarios of information seeking, some recurring patterns stand out. There seem to be certain activities, influence factors and sources of information in the captured information seeking behavior that are characteristic for the context of this study. Hence, the above described observations together with other artifacts from the exploratory study were analyzed in order to come to a more expansive and general model of information seeking.

First of all, a general classification of phases of information seeking is derived in section 5.3.1. Then the different types of tasks (section 5.3.2) and needed information (section 5.3.3) are defined. In this context a new type of information is introduced that acknowledges theoretical considerations as well as the observations of the exploratory study. Altogether these analyses resulted in the extension of existing central concepts of information needs, seeking and use studies in order to compensate the identified shortcomings for the context and interest of this doctoral thesis.

5.3.1 Phases of information seeking of young professionals

Before being able to examine the role of social software applications as source of information in the workplace, a conceptual model of this context and the activities of information seeking of the subject group of this study are required. In INSU research there have been various attempts to describe common activities, features, stages, or phases of task-based information seeking behavior (see chapter 3). Whether one of the previously developed models adequately represents the context of this study and therefore may serve as conceptual framework for the further analysis of the research interest of this thesis needed to be analyzed. This was achieved by comparing the observed with existing models of information seeking behavior. Based on this fit-gap analysis, a classification of phases of information seeking was derived.

Fit-gap analysis of existing models

A fit-gap analysis was conducted in order to analyze the correspondence of the observed phenomena with those described in existing models of information seeking. Thus, a context-specific model that adequately describes the information seeking behavior of young professionals based on the observations above (see figure 26) was derived.

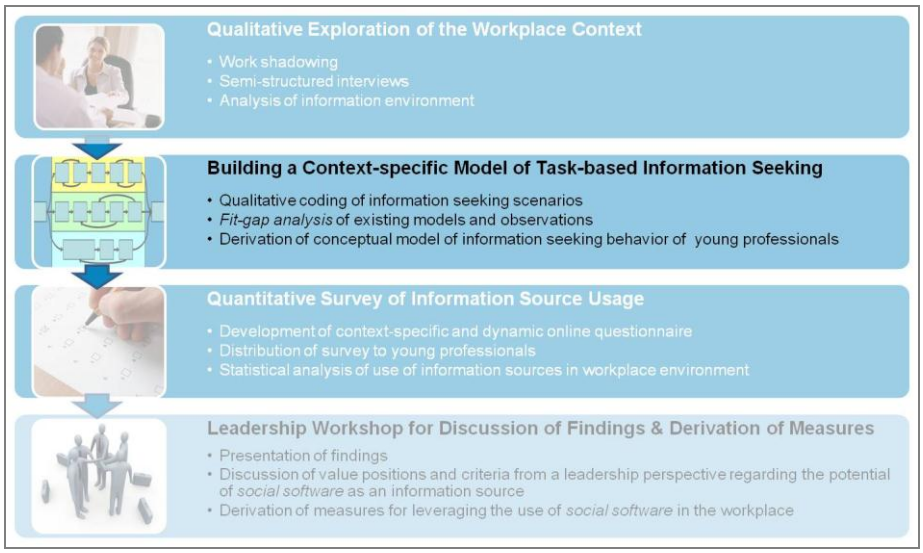


Figure 26 Building a context-specific model of task-based information seeking

In this analysis, each scenario was coded according to the most relevant models of information seeking presented in chapter 3. This methodical approach builds upon the study conducted by Makri (2008) on the information behavior of lawyers, where interviews and observations were transcribed and analyzed "[…] in accordance with the 'open coding' and 'axial coding' elements of Grounded Theory in order to identify recurring behaviors and how they might relate to one another" (Ibid.: 45). As presented in section 3.3.2 a set of process models was selected for this step based on their conformity with the scope, structure, method, type and applicability[43] of the observations of the qualitative exploration (see table 8):

- Ellis' characteristics of information seeking activities (1989) (arranged in a process model by Wilson (1999))
- Marchionini's sub-processes of information seeking (1995)
- Kuhlthau's stages of the information search process (1991)
- Cheuk's information seeking and using situations in the workplace (1998)

Table 8: Comparison of perspectives of existing IS process models and own observations in exploratory study

Ingwersen/Järvelin's Model Dimensions / Info-Seeking Models & Observation	**Scope** (broad vs narrow)	**Structure** (process vs static)	**Method** (abstract vs concrete)	**Type** (summary vs analytical)	**Applicability** (general vs specific)
Ellis / Wilson (1989 / 1999)	Broad	Process	Concrete	Summary	General
Marchionini (1995)	Broad	Process	(Abstract)	Analytical	General
Kuhlthau (1991)	Broad	Process	Concrete (Abstract)	Analytical	(General)
Cheuk (1998)	Broad	Process	Concrete (Abstract)	Summary	General
Observations of Exploratory Study	**Broad *(Narrow)***	**Process**	**Concrete**	**Analytical**	**(General)**

(extension of Ingwersen/Järvelin 2005)

The analysis of the gathered narratives focused on the accordance of the level of detail, sequence of activities and scope of existing models with the observed scenarios of information seeking. By means of this expert-based

43 These characteristics were derived from Ingwersen and Järvelin's dimensions of conceptual models described in section 3.1.3.

approach, the collection of scenarios was coded according to the description of each process phase of the respective model. This analytical method identified the existence of phenomena of the respective model in the observed scenarios of information seeking. Figure 27 presents an example of the analysis of scenario 8 'Getting to know new domains' (see section 5.1) coded with the ISP model developed by Kuhlthau (1991).

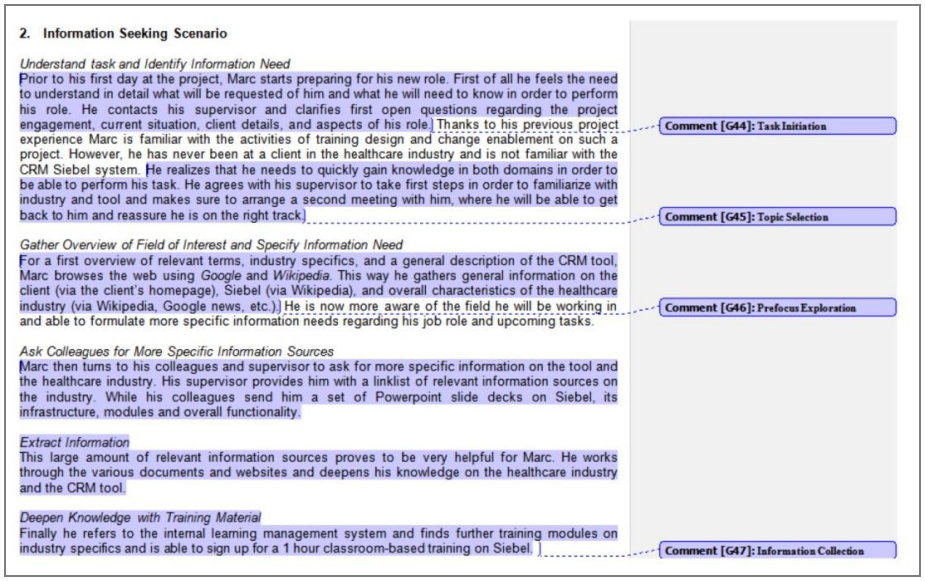


Figure 27
Example of qualitative coding (scenario 8 compared with Kuhlthau's ISP model)

Those sequences of the scenario that corresponded with activities of Kuhlthau's information search process were highlighted in blue and commented accordingly. On the one hand, the example presented in figure 27 reveals the applied method of '*qualitative coding*'. On the other hand, it also provides a first impression of the variables that could be extracted from the fit-gap analysis.

In order to evaluate the fit of the existing information seeking models for the perspective of this study, three indicators were extracted:

- amount of process phase overlaps ► *level of detail*
- amount of out of scope phenomena ► *scope*
- amount of process violations ► *sequence of activities*

A '*process phase overlap*' (a) refers to the situation, when there were one or more process phases (or features) of the existing model within a phase of the

observed scenario (vice versa) (see figure 27: ‘Task Initiation’ and ‘Topic Selection’ within one stage of the gathered scenario). An ‘out of scope phenomenon’ (b) was identified, when observed activities were not covered by the analyzed model (vice versa). A ‘process violation’ (c) refers to the case that the order of the observed activities contradicted with the sequential concept of the process model. The result of the qualitative coding analysis was visualized by aligning the observed scenarios of information seeking to the respective model. Figure 28 presents a schematic overview of this comparative visualization.

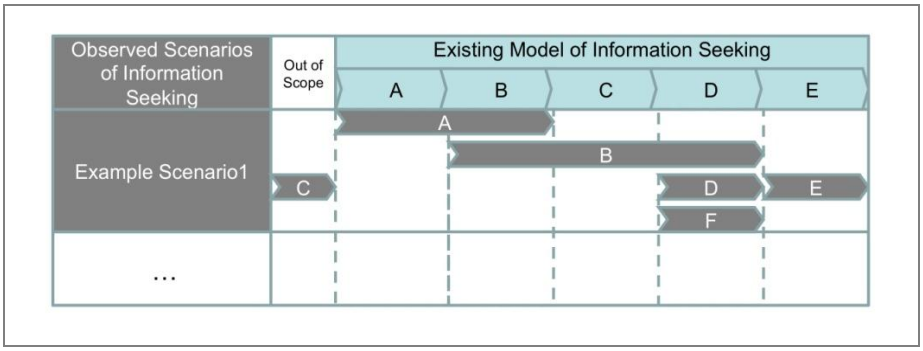


Figure 28 Schematic representation of fit-gap analysis

The example scenario presented in figure 28 also explains the measurement of the above mentioned indicators. The fit-gap analysis of this fictitious example would have resulted in

- *a = 4*, since there were four cases where one or more process phases (or features) of the existing model overlap with phases of the observed scenario (and vice versa),
- *b = 1*, since the activity in process phase *C* was not covered by the existing model and
- *c = 1*, since process step *F* broke the sequential structure of the existing model.

The ‘accumulated fit-gap score’ of this IS model based on example scenario 1 would therefore have summed up to 6. This result accordingly needs to be interpreted as follows: the lower the accumulated fit-gap score, the better does the existing model represent the observations of the qualitative exploration.

As described in section 4.3.2, the fit-gap analysis aimed at matching the conceptual frameworks of the above mentioned authors with the observed

phenomena in the context of this study. The results of this analytical scoring approach revealed large differences between the activities described in existing INSU research and the observed scenarios described in section 1.1. Table 9 provides a first overview of the results further elaborated below (for the detailed results see appendix A).

Table 9: Results of fit-gap analysis

Scenarios gathered in qualitative study	Sum of phase overlaps, process violations and out of scope phenomena with respective model of information seeking			
	Ellis/Wilson	Marchionini	Kuhlthau	Cheuk
Scenario 1	7	6	5	2
Scenario 2	5	5	4	3
Scenario 3	1	5	4	3
Scenario 4	3	9	3	4
Scenario 5	7	6	2	3
Scenario 6	4	10	2	4
Scenario 7	4	8	3	3
Scenario 8	1	8	2	2
Scenario 9	3	5	2	1
Scenario 10	3	8	1	5
Scenario 11	7	9	4	5
Overall Fit	45	79	32*	35

* a low value represents a low amount of contradictions and therefore a good fit of the respective model for representing the information seeking behavior observed in the gathered scenarios

From the selected examples of research, Marchionini's process model of information seeking (1995) turned out to be the model, which shows the least amount of accordance with the exploratory observations of this study. Even though this model is highly iterative and therefore covers the observed aspect of reciprocity in information seeking and even though the study contexts[44] match quite well, it does not fit for the purpose of this doctoral thesis. This is due to the fact that Marchionini is mainly concerned with the interaction between the human user and an information system. Accordingly, the level of detail of the process steps described in his model is quite high. Especially the

44 Marchionini conducted his research in a corporate setting with 'knowledge workers' as a target group.

phases ‘select source’, ‘formulating query’, ‘execute query’ and ‘examine results’ are very small units of information seeking behavior and caused a large amount of overlaps with the phases observed in the scenarios of the exploratory study. Consequently, the fit-gap analysis did not return any process violations or even found phenomena, which were not within the scope of the model. Solely the differing level of detail proved to be the reason for this model to appear inadequate for the purpose of this study.

As explained in section 3.3.2 Ellis’ behavioral model of information seeking (1989) describes a set of general features of information behavior. For itself this model does not define any sequential order of activities. Wilson (1999), however, arranged these features in a sequential order, which enabled the analysis of this model in the described methodology. The high level of abstraction of the features of information behavior caused little overlaps with the gathered scenarios. A further strength of this model is that it has been validated in a workplace context. The fit-gap analysis, however, revealed a variety of weaknesses regarding the fit for the purpose of this study. On the one hand, it was noted, that the procedural arrangement of features by Wilson, which so far lacks empirical validation, does not match the observed behavior. The absence of iteration caused quite a large amount of process violations. Furthermore, Ellis’ features do not cover the phenomena of information need analysis or activities aiming at the clarification of the problem or task. Finally, it was noted that the model does not consider analytical interrelations between the type of the task and the type of the consulted information sources.

The information seeking and using process model by Cheuk (1998) revealed a large degree of accordance with this study regarding its context and methodology. As described in section 3.3.2 it is based upon a qualitative study of the information seeking and use process of eight auditors and eight engineers in their workplace. The use of the sense-making methodology resulted in a non-linear and dynamic model, which caused little contradictions with the observed scenarios of information seeking. Altogether few of the observed phenomena were out of this model’s scope and not many process violations were discovered. However, the level of detail once again proved to be a differing element between existing model and the perspective of this study, causing a notable amount of process phase overlaps. The activities described in Cheuk’s model remain on a very high level of abstraction (‘task initiating’, ‘focus forming’, ‘ideas assuming’, ‘ideas conforming’, ‘ideas rejecting’, ‘ideas finalizing’ and ‘passing on ideas’), which does not serve the

purpose of this study. Furthermore, it proved to be difficult to grasp Cheuk's concept of 'idea', which hindered the comparison with other models and the perspective of this study. In addition, it needs to be taken into consideration that Cheuk's model has a strong focus on the affective dimension, which does not play a vital role in the perspective of this doctoral dissertation.

Finally, it was assessed that Kuhlthau's information seeking process revealed the best fit compared to the qualitative observations gathered in the course of this study. It showed the least amount of process phase overlaps, process violations and out of scope phenomena. The common point of departure for model and observation is a task or problem, which – in the following – needs to be solved by the individual. The ISP also represents one of the most cited and evaluated models of information seeking and has been evaluated in various contexts. For the fit of this study, however, one needs to take a variety of aspects into consideration. First of all, the focus of Kuhlthau's model lies on the affective component of information seeking. Based on the concept of uncertainty as trigger for information seeking, Kuhlthau modeled not only the activities of information seeking but especially focused on the emotional states of the individual during this process. Since this dimension was neither measured in the exploratory study nor considered essential to the purpose of this study, the ISP model does not represent the perspective of this thesis very well. Furthermore, Kuhlthau's model reveals two central weaknesses. On the one hand, it is a primarily linear process model and has a strong focus on the library context. Almost all initial validations of this model were conducted in the context of scientific information seeking and refer to a very different use case scenario. On the other hand, the ISP model lacks an analytical perspective on the interrelation between the type of the problem, the type of information needed and the respective activities of information seeking.

The comparison of the gathered scenarios of information seeking behavior in the given context with the above mentioned existing research models provided essential findings for the understanding and definition of the perspective of this doctoral thesis. Nevertheless, none of these studies sufficiently offered an adequate theoretical model and foundation for the further analysis of this study. The latter aspect in regards to Kuhlthau's model turned out to be a central theme in the fit-gap analysis. It pointed to another relevant dimension outside of the dimensions analyzed until here: the integration of an analytical perspective regarding factors that influence the relevance and sequence of activities of information seeking into the dominant process per-

spective of the models selected for the fit-gap analysis. Section 1.1 will further elaborate on this aspect and define the requirements for an extended model of information seeking.

Classification of identified information seeking activities

Based on the scenarios of information seeking gathered in the exploratory study, the literature analysis of selected, existing models of information seeking behavior and the results of the fit-gap analysis, a classification of information seeking activities was derived (see figure 29). Altogether, seven phases of information seeking were identified, which correct the earlier described misfits. Depending on the task complexity, the type of information and the overall context (which will be closer defined further below) young professionals in management consulting can be considered to engage in all or some of the following phases of information seeking when being confronted with a new work task:

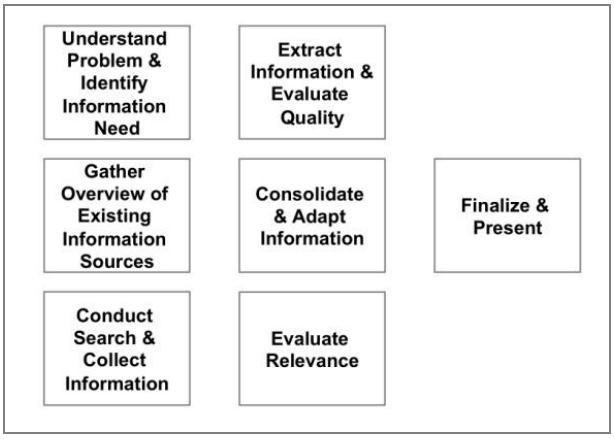


Figure 29 Activities of information seeking

The following description of the respective behavior and involved actions define the respective phase in further detail.

Understand Problem & Identify Information Need

The employee gathers further information in order to understand the problem and the expected outcome. He/she compares the problem and anticipated result with his/her existing knowledge. Thus, he/she identifies what information is required in order to successfully solve the defined problem. Based on a realized and defined information need, he/she is able to continue in/return

to other activities of information seeking. → Actions: *ask, reassure, discuss, analyze*

Gather Overview of Existing Information Sources

The employee gathers an overview of the information sources he/she has at hand. He/she is able to evaluate what information he/she is able to use from sources directly related to the task and his/her situational and organizational context. Based on this overview, he/she may specify his/her further information need and identify information sources he/she will need to refer to. → Actions: *browse, ask, scan, follow references*

Conduct Search & Gather Information

Either having identified or having been pointed at further valuable information sources, the employee conducts specific searches. He/she collects all the retrieved information from the respective sources and gathers a variety of information artifacts without closer evaluation. → Actions: *formulate query, execute search, save results*

Extract Information & Evaluate Quality

The employee closely extracts and interprets the information from different sources and artifacts. This includes a first evaluation of its relevance to the information need and extraction of the most valuable aspects of the retrieved objects. → Actions: *read, analyze, evaluate*

Consolidate & Adapt Information

The various objects of retrieved information are combined and merged into one perspective. In addition to the newly extracted information, existing pieces of information are also included in the consolidation of findings into one knowledge object. This may also mean that previous positions are revised and changed. → Actions: *merge, adapt, write, draw, correct*

Evaluate Relevance

The information sought in the previous activities is evaluated regarding its relevance and effectiveness for the identified information need and the task to be solved. Based on this review, the employee may need to repeat previous activities. → Actions: *ask, discuss, evaluate*

Finalize & Present

After having evaluated the relevance of the information gathered so far, final corrections are made in order to be able to present the information most adequately. Then the information is either used for solving the task or satisfying the identified information need. → Actions: *correct, write, adapt, present*

This set of phases best represents the information seeking behavior of young professionals in management consulting as it was observed in the exploratory study. As an inductive classification and conceptualization of the observed behavior, it furthermore corresponds with the perspective and level of detail required to support the research interest of this thesis. As it was elaborated in section 1.1, it is essential to come to a conceptual framework that meets these requirements in order to further analyze the role of social software as a source of inormation in the workplace. Apart from the behavior itself, the context of these activities and, thus, the factors influencing the way young professionals seek information in the workplace need to be understood. Only the acknowledgement of these central elements of INSU behavior then allows coming to a behavioral conceptual framework that models the sequential occurrence of the above described activities of information seeking.

5.3.2 Types of tasks in management consulting

The way individuals seek information is influenced by a variety of contextual factors, as section 3.3.1 has shown. In this matter, the concept of task plays an important role in INSU research in two different ways. On the one hand, it is considered to explain why something happens and the kind of relationship that exists between task and information activities (*theoretical focus*). On the other hand, it facilitates registering and describing what and how something happens (*empirical focus*) (cf. Byström 2007). In accordance with the previous research findings presented in chapter 3, the analysis of the described observations has revealed that the type of task that young professionals are confronted with has a strong impact on the way they engage in information seeking activities. In the observed situations and gathered critical incidents, the work task represented a central factor in the overall situational context of an information seeking scenario. These work tasks, typically assigned to the analyst or consultant by a supervisor or client, were of varying complexity and evoked different information seeking and information retrieval tasks. The

scenarios of work tasks in management consulting derived from the qualitative observation as well as the semi-structured interviews confirmed the tripartite perspective on *a priori* determinability as developed by Byström and Järvelin (1995) (see section 3.2.2). Participants categorized the complexity of their respective task in regards to the information, process and result it required in order to solve them.

The analysis of the derived scenarios, however, revealed that the granularity and terminology of Byström and Järvelin's (1995) conceptual work on task types proved not to be feasible for the context of management consulting. Especially the differentiation between a 'normal information processing task' and 'a normal decision task' or a 'known, genuine decision task' was not supported by the gathered data. This applies for the subjective perception by the participants as well as the analytical classification by the author. After having observed and interviewed the subjects of the sample group of this study, a less granular differentiation and a more context-relevant terminology of work task types was developed as an adaptation of Byström and Järvelin. This resulted in the following classification of common types of work tasks in management consulting with differing complexity:

- '***Information extracting tasks***' are almost completely *a priori* determinable regarding the information needed for completing the task, the process of how to approach it, as well as the expected result of the task. Granted that all of these aspects may be completely anticipated, they could be automated. Or else they require only little intellectual arbitration and confine themselves to processing existing information. Information extracting tasks typically are subunits of task types with a lower degree of *a priori* determinability.

  Example within management consulting: An employee is asked by his/her client or colleague to create an overview presentation of the Latin-American smartphone market for a potential entry strategy. She/he is given a pre-assembled presentation, where only final facts on population statistics and market size are missing. She/he is pointed to a report, which contains the missing information and asked to extract the missing data in order to fill it into the presentation.

- '***Case-based decision tasks***' are still quite structured, but case-based arbitration plays a major role in them. The information needed for completing the task and the process of how to approach it, are partly indeterminable. The type and structure of the result, however, are *a priori* foreseeable. In order to complete these tasks the actor can, therefore, in-

fer from existing information but needs to come to partly new conclusions. Case-based decision tasks accordingly require professional judgment by the actor and may include subunits of information extracting tasks.

Example within management consulting: An employee is asked by his/her client or colleague to create an overview presentation of the Latin-American smartphone market for a potential entry strategy. She/he is given a pre-assembled presentation, where the general structure is already specified but the needed information is not obvious right away. In order to decide which information is relevant and how to present it, he/she is given deliverables from related tasks, which serve as valuable examples.

- '***Investigative decision tasks***' are defined as those tasks, where the type and structure of the result may *a priori* be anticipated, but permanent procedures for performing the task have not yet emerged. Thus, the process is largely unforeseeable and so are its information requirements. Completing such tasks therefore requires a large amount of investigative activities in order to identify the right information sources and extract relevant information in order to found decisions on how to approach the task and create the expected result.

  Example within management consulting: An employee is asked by his/her client or colleague to create an overview presentation of the Latin-American smartphone market for a potential entry strategy. She/he is told that an overview presentation in a certain format is expected, but he/she will need to gather related deliverables from previous tasks individually in order to understand what exactly the presentation is supposed to look like. At this point of time it is mostly unclear to him/her which information is required in order to solve the task.

- '***Unstructured exploration tasks***' present the lowest degree of *a priori* determinability. Thus, neither the type and structure of the process as well as its result nor the information requirements can be anticipated in advance. Therefore, activities aiming at structuring the problem have highest priority, which may result in the processing of any of the before mentioned task types.

  Example within management consulting: An employee is asked by his/her client or colleague to create an overview presentation of the Latin-American smartphone market for a potential entry strategy. What exactly is expected from him/her initially remains unclear. She/he needs to find out for himself/herself what the expected outcome is supposed to look like, develop his/her own approach on how to get there and identify the information he/she needs in order to succeed.

These concepts best differentiate the different types of tasks in the work context of the subjects of this study as they were observed in the exploratory study. They were constructed along the lines of previous INSU research in regards to the three elements of task complexity in terms of *a priori* determinability of information need, process and expected result. They are, however, characterized by a lower granularity and use a language that fits the context of this study. The differentiation between the different task types is expressed by the denomination as 'extracting', 'decision', or 'exploration' task on the one hand. And it is further refined by the description of being 'case-based', 'investigative', or 'unstructured' on the other hand. These different types of tasks are characterized by their complexity. Other aspects were not explicitly included since they are considered to be covered by the dominant feature of complexity.

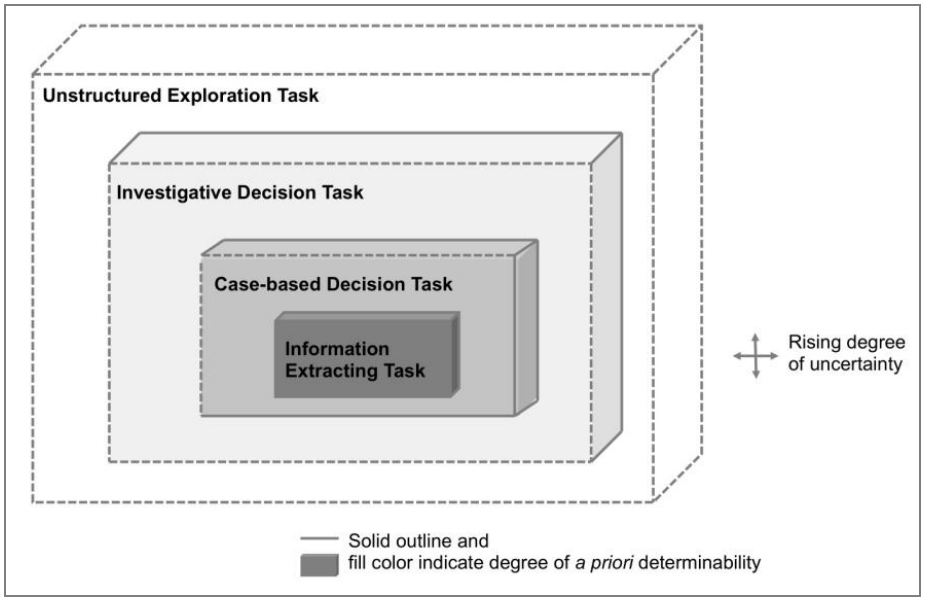


Figure 30
Concepts of information-related work task types in management consulting

In addition to these adapted concepts of common work tasks, a new form of visualization was chosen as extension to those in previous INSU research. It includes another finding from the observations in the exploratory study, expressing the fact that a task of high complexity contains a set of less complex sub-tasks along the process of information seeking. This corresponds

with the definition by Byström (1999), where a work task was characterized to have a recognizable beginning and end and consist of a series of sub-tasks, resulting in a meaningful product (cf. ibid.: 24). This aspect was very present in the observation of the selected context and was therefore included in the conceptual visualization of task types (see figure 30). It expresses rather the interrelation and nesting of the different types of tasks than the tripartite components of task complexity as depicted by Byström and Järvelin (1995) in figure 10.

This conceptual understanding of information-related work tasks and the different types based on task complexity is a central foundation for modeling the information seeking behavior of young professionals in management consulting. In this domain and target group, a task – most commonly assigned by a supervisor or client – represents the initiation of directed information seeking with the goal to solve the task and produce a structured deliverable. This is also a result of the scope of this thesis, which focuses on task-based information seeking (and partly usage) as opposed to undirected information behavior activities such as 'passive attention', 'ongoing search' or 'passive search' (cf. Wilson 1997). As mentioned in the introduction of this section, the concept of task provides a theoretical notion as well as an empirical unit for this context and study. It therefore needs to be included when building a context-specific model of information seeking for the research interest of this study. Furthermore, it did not only build the foundation for the context-specific survey of information source usage of the subsequent methodical step but also needed to be validated by the same. Thus, the empirical study tested whether the most common work tasks of young professionals in the context of management consulting indeed are characterized by a high degree of complexity as described in section 1.4.

5.3.3 Types of information in management consulting

The activities of information seeking and the common types of information-related work tasks in management consulting as defined above represent two central pillars for the context of this study. A third, however, is intrinsically tied to these concepts: the character of the sought information that is required for solving the different types of tasks. As described in section 3.2.3, the characterization of information strongly depends upon the scientific discipline and perspective on a certain research interest. For the field of task-

based information seeking research, the presented classification of 'task information', 'factual[45] information' and 'task-solving information' (cf. Järvelin/Repo 1983; Barr/Feigenbaum 1981; Byström/Järvelin 1995) has proven to be most perceived. While these types of information have been recognized in educational as well as professional contexts (e.g., health industry or engineering), the qualitative exploration has also revealed their applicability for the context of this study. In the following, these acknowledged INSU concepts were therefore transferred to the management consulting domain.

'Task', 'factual' and 'task-solving information' in management consulting

- '***Task information***' (TI) is typically required in order to provide the analyst or consultant with a better understanding of the problem the respective client or supervisor is faced with. This may apply to scope and aim of a task as well as its time and cost constraints. Oftentimes tasks that young professionals in this context are assigned to are poorly defined. Thus, they need to seek task information in existing project documentations, personal interviews with the client counterpart or supervisor, or in any other information source. This provides them with the background knowledge required in order to plan their efforts accordingly and eventually be able to create a solution that meets the specific requirements of the given task and context.
- '***Factual information***' (FI) presents certain facts and concepts in the domain of the task at hand. As explained in section 4.1, this can broadly be distinguished in two different facets: either the respective industry (e.g., pharmaceutical or automotive) or the function of a client or project (e.g., controlling or marketing). Hence, information from such realms may consist of certain processes, market statistics, or product characteristics. Oftentimes young professionals in management consulting are quite knowledgeable in one of these areas but need to dive deeper into a certain topic area or have to get acquainted with the legalities of an industry when being confronted with a new task or project role. They may typically find factual information in professional databases, handbooks, journals and magazines. This provides them with the knowledge required in order to create a solution of high quality that is correct for the given domain of the task.

45 As discussed in section 3.2.3, the term 'factual information' refers to the concept of 'domain information', which is most commonly used in INSU studies, in order to avoid irritations with a different connotation of this term from the field of IR research.

- '***Task-solving information***' (TSI) describes the methods of problem treatment. It explains how a task may be approached and what problem and factual information should be used. In workplace environments, where routine tasks are most dominant, this type of information does not play an important role. In such a project-based context as management consulting, however, young professionals are often facing new tasks in new job roles. Thus, they need to seek task-solving information in order to understand how they should apply the information types mentioned before. This type of information is often provided by the employer by means of methodical frameworks and guidelines. Furthermore, more experienced colleagues may represent an important point of contact. This provides them with the background knowledge required in order to use the right methods and come to a solution that applies the required task and factual information accordingly.

The concept of 'social information'

As anticipated in section 3.3.1, the types of information developed by Byström and Järvelin (1995) needed to be extended in order to satisfy the requirements of the context of management consulting. From the data gathered in the exploratory study, a further type of information emerged. Since young professionals in management consulting are heavily reliant upon previous experiences and carry a certain moral obligation to the client, a different kind of task-solving information plays an important role. Gorman (1995) described this kind of information in the context of his study of information needs of physicians as '*social influences*'. This "[…] refers to knowledge about the expectations and beliefs of others, especially peers such as colleagues and consultants, but also including patients, families, and others in the community" (Ibid.: 731). This perspective on information was also expressed by Brown and Duguid (2000) in their essay on 'the social life of information'. Therein they called for a consideration of the context, background, history, common knowledge and social resources that are inherent in the environment of factual information. This type of meta-information:

> "[…] provides valuable balance and perspective. It holds alternatives, offers breadth of vision, and indicates choices. It helps clarify purpose and support meaning. Indeed, ultimately it is only with the help of what lies beyond it that any sense can be made of the information that absorbs so much attention." (Ibid.: 1)

Even though there have been these kind of considerations in previous publications, INSU studies in the context of knowledge-intensive business services have not taken the social aspect of information into account. Transferred to the research perspective of this thesis, however, this type of information emerged as a fourth and central information type in addition to the concepts mentioned above. Considering the cited positions (cf. Gorman 1995; Brown/Duguid 2000) and the data gathered in the work shadowing sessions as well as semi-structured interviews and document analysis, the following definition for this type of information was derived:

'***Social information***' (SI) contains person-specific aspects of task, factual and task-solving information. It defines norms and values relevant for finding and applying the relevant task, factual and task-solving information. It comprises mainly subjective and evaluative answers to the information requirements that are specific to the cognitive actor (e.g., values and experiences from previous projects of trusted colleagues). Accordingly, it can be found in the social environment of the cognitive actor.

Adding this new type of information to the existing classification of Byström and Järvelin (1995) and applying it to the context of management consulting allows for a finer differentiation and highlights the importance of this concept for the purpose of this thesis. It provides the analyst or consultant with practical knowledge that clients expect not necessarily from the individual but rather the organization that they turn to for external consulting services. As described in section 4.1, it is one of the main value propositions of consultancies to bring an external perspective and experience with the respective type of project to the table. When being confronted with a new task, analysts or consultants thus need to seek social information in order to understand what experiences and values need to be considered when developing a solution. They may typically acquire this knowledge by turning to trusted clients and experienced colleagues or digital assets created by the same. Social information in management consulting may be understood as central element of the consultant–client relationship.

The literature review of existing INSU concepts, the observations as well as interviews of young professionals and the document analysis in the exploratory study have led to this differentiated classification of types of information. The descriptions of each of these already give a first impression of their interplay with the before mentioned levels of task complexity as well as phases of information seeking. They further reveal that such a differentiation of information types ought to be included in the aspired conceptual frame-

work in order to acknowledge all aspects of information seeking behavior relevant for the research interest of this doctoral dissertation. Most importantly, the identification of social information as a key characteristic of social software applications (as argued in section 2.3.3) along with the here described importance of this type of information in the context of management consulting further discloses the significance of the research interest of this thesis regarding the role of social software in the workplace of young professionals in management consulting.

5.3.4 Classification of the information environment in management consulting

As a final prerequisite for the further analysis, the existing information sources in the workplace environment of management consulting were classified based on the data gathered in the qualitative exploration. As described in section 3.2.4, an information environment refers to "all information access systems" (Ingwersen/Järvelin 2005: 13) in the contextual environment of a cognitive actor. While some studies have for example considered intranets to be "complex, heterogeneous" (Freund 2008: 28) information environments, the broader scope of information seeking behavior research also includes other electronic as well as physical or human resources. Thus, this term describes all sources of information accessible to the information seeker. Even though the research interest of this thesis lies on the electronic information environment, which represents a sub-category of all information sources, the observations of the qualitative exploration included every point of contact the observed employees turned to in their need of information.

The scenarios of information seeking presented in section 1.1 as well as the analysis of the documents provided by the visited project teams reveal that the information environment of young professionals in management consulting is very diverse. Still, just as previous INSU studies (e.g., Ellis 1993; Case 1991; Leckie et al. 1996; Choo 1993; Johnson 2004) have shown for different groups of employees (e.g., CIOs, lawyers, engineers, health care professionals and academic researchers), personal contacts seem to play an important role in order to solve a new task at hand. In addition to this, traditional resources such as journals, magazines, newspapers, (hand-) books, as well as instructor-led trainings and other forms of corporate education make up a large amount of information sources available to young professionals in

management consulting. Furthermore and most importantly, however, the workplace environment of today's knowledge workers is highly dependent upon electronic resources. This may be a digital file on the personal hard drive or a team's network drive. And most definitely, a large amount of the required information is accessible via the corporate intranet or public websites on the Internet. On the one hand, Internet search engines themselves can be considered an essential information source, since they reveal an overview of existing information sources and their relevance to a certain query. On the other hand, the listed Internet sites primarily provide information created by online content providers as well as any user publishing content on a public website. All of these information sources are most commonly accessible to the subject group of this study. In order to structure the more than 80 anecdotal sources of information gathered in the observation and interviews of the exploratory study, a categorization was developed, segmenting the available information sources into the following groups:

- personal contact sources (PCS):
  persons in the immediate work or personal environment
- personal hard drive / team's *SharePoint* (PHD):
  digital resources on personal desktop or network drive
- printed factual sources (PFS):
  manuals, college material, books and other printed material
- intranet knowledge sources (IKS):
  corporate or client intranet sites and other internal databases
- instructed training sources (ITS):
  classroom or web-based trainings, as well as eBooks and other learning material
- social intranet sites (SIS) :
  internal people pages, wikis, bookmarking and *Media Exchange*
- Internet search engines (ISE):
  publicly accessible web search services such as *Google* or *Bing*
- factual Internet sites (FIS):
  publicly accessible websites such as dictionaries, glossaries, manufacturer homepages, online journals and more
- external wikis (EWI):
  publicly accessible wiki projects such as *Wikipedia* or *Wikihow*

- social sharing sites (SSS):
  publicly accessible sharing services such as *Slideshare*, *Delicious*, *Twitter*, *YouTube* and also instant messengers
- social networking sites (SNS):
  public online social networks such as *Facebook* or *Linkedin*

This classification of information sources in the information environment of management consulting is a result of aligning all of the reported and observed sources of information with categories developed by previous INSU studies. Specific to the research interest of this study, the various social software applications were defined with a higher level of detail. Accordingly, it was distinguished between internal social applications (*social intranet* sites) and the different types of *social web* services that are publicly accessible: social sharing sites, external wikis and social networking sites (see section 2.1.2). Weblogs were included in the category of social sharing sites since they did not play any role in the exploratory study. These categories represent the information environment in management consulting as it was perceived by the observed and interviewed subjects. Additionally, these different types of information sources were analyzed regarding the content and dominant type of information they most commonly provide. This obviously may differ according to the task at hand and the specific information need of the user, but in most cases a common characteristic could be identified.

The detailed description of contents provided by the respective information sources reveals that personal contact sources are the most diverse source of information since personal contacts such as colleagues (supervisors and peers) or clients are turned to in order to better understand the requirements of the task itself as well as to gather previous experiences, opinions, instructions and hints on where to look for further information. Thus, it is difficult to determine one or two most dominant and characteristic types of information. According to the context of a task, this may be considered either task, task-solving or social information. As previous studies have shown, personal contact sources are the most important source of information in a variety of workplace contexts. Regarding other categories, it is easier to define a dominant type of information typically provided by the same based on the data gathered in the qualitative study.

Documents and other digital information objects retrieved from the personal hard drive or shared network drive were found to primarily offer information on the task itself (TI), such as the structure of a deliverable, design

guidelines, deadlines, project scopes and requirements documents, or on how to solve a task (TSI), for example in the case of work plans, design guidelines and previous presentations. The category of printed factual sources most commonly provides the individual with factual information, since books, manuals, reports, or college material mainly typically convey information about the theories, laws and concepts of a certain functional or industrial domain. This also applies to instructed training sources, as they are a way to transfer this type of information to employees that are new to a certain domain or topic. On the contrary, the corporate intranet primarily offers task and, more importantly, task-solving information. As a central element of internal knowledge management, young professionals in management consulting rely on deliverables, credentials and other background information on a client or a certain type of project situation in order to benefit from the organizational knowledge database. The social intranet sites take this principle a step further and moreover provide the employee with experience and opinions from colleagues in the form of bookmarked online resources that are worth considering, blog entries with personal evaluations and recommendations, as well as personal background information. The type of information contained in these sources is not necessarily addressed to a certain task context but offers value-based and subjective information that may be helpful for solving a task in a certain manner. This category of information sources, as well as the publicly accessible social networking sites and social sharing services are therefore considered to mainly provide social information. Finally, information sources within the categories of Internet search engines, factual Internet sites and most importantly external wikis include a wide range of content. Especially in the case of the last two categories, it is evident that they mainly provide the information seeker with factual information regarding markets, companies, or products in the form of definitions, reports or encyclopedia entries. As indicated earlier, search engines have an ambivalent informational value. On the one hand, they only provide a list of relevant links for a certain query. In this case, a search engine can be considered a channel rather than a source. On the other hand, most Internet search engines already provide the user with a first snippet of each of the search result pages and therefore provide a certain amount of factual information. Also the ranking of resources itself can be considered to have a certain informational value. As mentioned above, this alignment only expresses the most dominant relationships of sources and types of information.

This classification of the information environment in the workplace of management consulting guided the subsequent quantitative study regarding the use of information sources in the workplace. The alignment of the developed categories with their dominant type of information will furthermore be relevant to the further analysis and the design of the electronic information environment in order to support the task-based information seeking activities of young professionals.

5.3.5 Examples of social intranet sites: 'Collaboration 2.0' at *Accenture*

As the described classification of information sources reveals, there is a large variety of social software applications available in the considered electronic information environment. Most notably the category of social intranet sites points to the observation of the rise of internal applications in the style of popular web 2.0 phenomena, which was further described in section 2.3.2. In the context of this study, the variety of integrated social software applications in a corporate information environment is best visualized at the example of *Accenture*'s '*Collaboration 2.0*' initiative.

Driven by the CIO organization this initiative aims at equipping Accenture's employees with collaborative capabilities in the fields of connecting, networking, sharing and teaming. As figure 31 shows, the areas of connecting and teaming are matters of computer-mediated communication or virtual teamwork. The provided technologies and services cannot be considered part of the scope of this study. As the further fields and the respective right hand column reveals, however, *Accenture* employs numerous social software applications to support social networking and sharing. According to the above described classification, all aspects of social software are included in the internal information environment at the workplace of young professionals in management consulting.

Figure 31 Accenture's *Collaboration 2.0* initiative

The *Accenture Portal* is the entry point for *Accenture People* (see figure 32), the shortest distance between each individual professional and *Accenture* experts in every conceivable discipline. Designed along the lines of social networking sites, *Accenture People* profiles list professional experience, education, areas of expertise and preferred contact methods. Together with the characteristic display of 'colleagues in my network' this variety of functionalities highlights the differences to traditional digital yellow pages. As an essential HR function within management consulting, the scheduling and skill management of the employee may also be visualized via *Accenture People*. Furthermore, workers can use the internal blogging platform to write blog entries or update and share their status with others, as well as see the status of colleagues. This also offers the opportunity to comb through the approx. 215,000-member *Accenture* workforce to find experts in any given subject area.

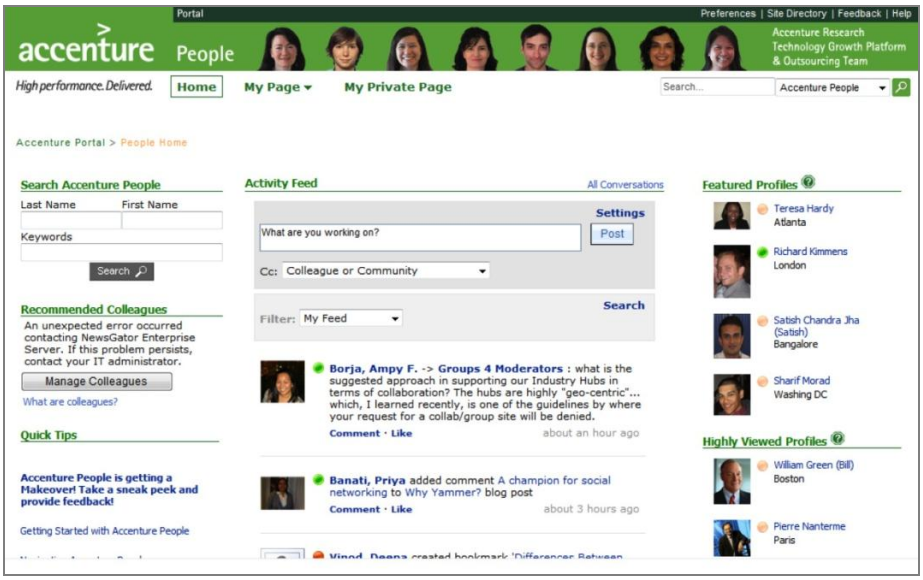


Figure 32 Screenshot of *Accenture People*

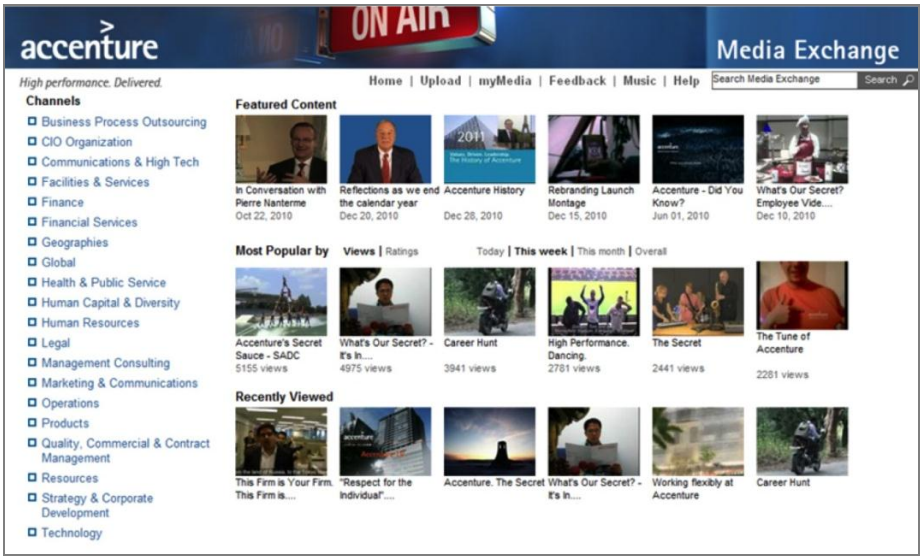


Figure 33 Screenshot of *Accenture Media Exchange*

Other popular *Collaboration 2.0* tools tap into the collective creativity of *Accenture* professionals, beginning with *Accenture Media Exchange* (see figure 33), where anyone can post the latest multimedia content, learning tutorial or team meeting. Digital content posted on the site may be viewed by

hundreds or even thousands of colleagues within a few days. Viewers can rate and comment on the posted content and download digital assets.

Another aspect of social sharing is realized by the company's own social bookmarking service. Internal as well as external resources may be saved, tagged and shared with other employees or groups via *Accenture People*. Finally, a corporate wiki called *Accenture Encyclopedia* applies the collaboration principles learned from the *Wikipedia* to the corporate context. Workers may create, edit and share articles about certain industry trends, technologies, or internal processes and abbreviations. It is not the purpose to create an extensive encyclopedia but rather to document experiences and information most relevant for the work of management consultants, technology specialists and other staff of *Accenture*. These few examples show that indeed all aspects of the social web may find an internal counterpart in the aspiration to benefit from social web phenomena inside corporate boundaries. One characteristic of this portal solution at *Accenture* is, that the lines between the different applications and information sources are blurring. The user is presented with one common interface and therefore does not necessarily differentiate between a blog, a social network, or a wiki. It is, however, rather a question of corporate culture than of technical solutions to bring these concepts to life. Chris Miller, the *Collaboration 2.0* initiative lead, hence believes that the program is about much more than just the tools:

> "The greatest power of collaboration technologies lies in supporting new ways of working and interacting that simply were not possible or feasible before. By the time we are done, we're expecting that our Collaboration 2.0 initiative will help Accenture work more effectively as a single global team, every single day" (Accenture 2009: 6).

5.4 A context-specific model of task-based information seeking of young professionals

As it was argued in section 1.1, a deep understanding of the phases of task-based information seeking, their influence factors and the information environment at the workplace of young professionals is required in order to be able to survey the usage of information sources and analyze the role of social software in this context accordingly. The presented qualitative findings al-

lowed detailed insights into the work environment of young professionals and the validity of theoretical concepts within the field of INSU research. In an inductive argumentation, these findings were then transferred into a context-specific model of task-based information seeking, which provided guidance for the further analysis of social software applications and their context of use.

The review of previous findings in the field of information needs, seeking and use research in chapter 3 has shown that there are valuable models and concepts in order to describe information seeking behavior of cognitive actors in various workplace realms and contextual factors influencing the same. As summarized in section 3.3.3, however, there is reason to criticize certain shortcomings regarding the integration of findings from analytical and process-oriented information seeking models into one holistic model of task-based information seeking in the workplace. The analysis of the data gathered in the qualitative exploration has furthermore revealed, that existing IS models lack applicability for the context of management consulting in regards to the level of detail and scope of the research interest of this study. The detailed analysis of the workplace context and subject group in the qualitative exploration have resulted in adaptations of such existing INSU concepts as phases of information seeking, types of tasks and information. This was particularly highlighted by the comparison of the observed information seeking phases of young professionals (see section 5.3.1) with existing process models in the fit-gap analysis, as well as the transfer of existing definitions of task (see section 5.3.2) and information types (see section 5.3.3) to the context of this study.

As a first step of building a context-specific model of task-based information seeking that served as foundation for the empirical analysis of information source usage in the workplace environment these analytical concepts were connected with each other. Based on Byström's (1999) analysis of the interplay of task complexity, types of information and amount of information sources used (see section 3.3.1) the concepts defined in this study may be related to each other. Applying the statement by Byström that "[…] the higher the degree of task complexity, the more probable is the need for multiple information types: first task information, then task and domain [factual] information, and finally task, domain and task-solving information" (Ibid.: 122) to the adapted concepts developed for the context of management consulting, the interplay of task and information types may be conceptualized as displayed in figure 34.

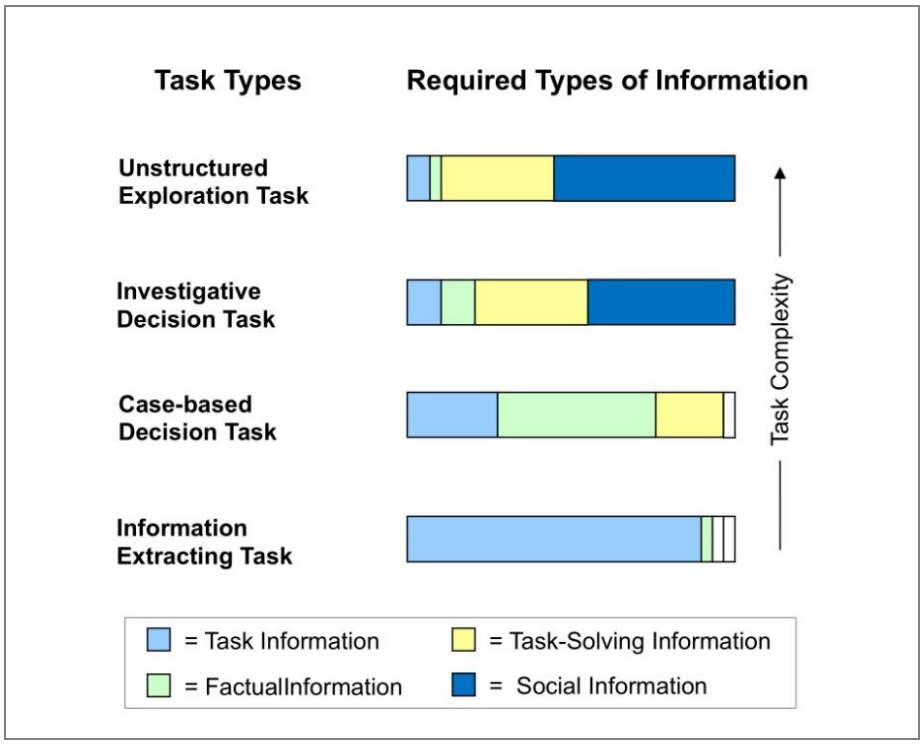


Figure 34 Interplay of task and information types

This expresses the consideration that, while tasks, which are *a priori* completely or mostly determinable, call for a large degree of task information or factual information, more complex tasks require the individual to seek information, which is more concerned with the problem treatment itself. Thus, a rise in task complexity causes a change in the type of information needed. Picking up Byström's train of thought, this would mean that young professionals in management consulting are likely to turn to a large amount of information sources in order to seek task-solving and social information, when being confronted with an unstructured exploration task or investigative decision task.

Accordingly, it is important to summarize all relevant contextual factors and elements of the observed in the light of such analytical models as developed by Leckie et al. (1996) (see section 3.3.1) in order to serve as a conceptual framework for the task-based information seeking of young professionals in management consulting. Figure 35 presents such a framework highlighting the context, in which the process of information seeking behavior is

to be allocated. This visualization combines Byström and Järvelin's concepts of information-related task types and types of information needs, as well as their influence on task complexity with Wilkinson's (2001) scheme of interrelating factors of information seeking behavior, such as organizational context, situational context, personal factors and work role. These two analytical models were combined and extended in order to visualize influences of the process of information seeking and the type of information source.

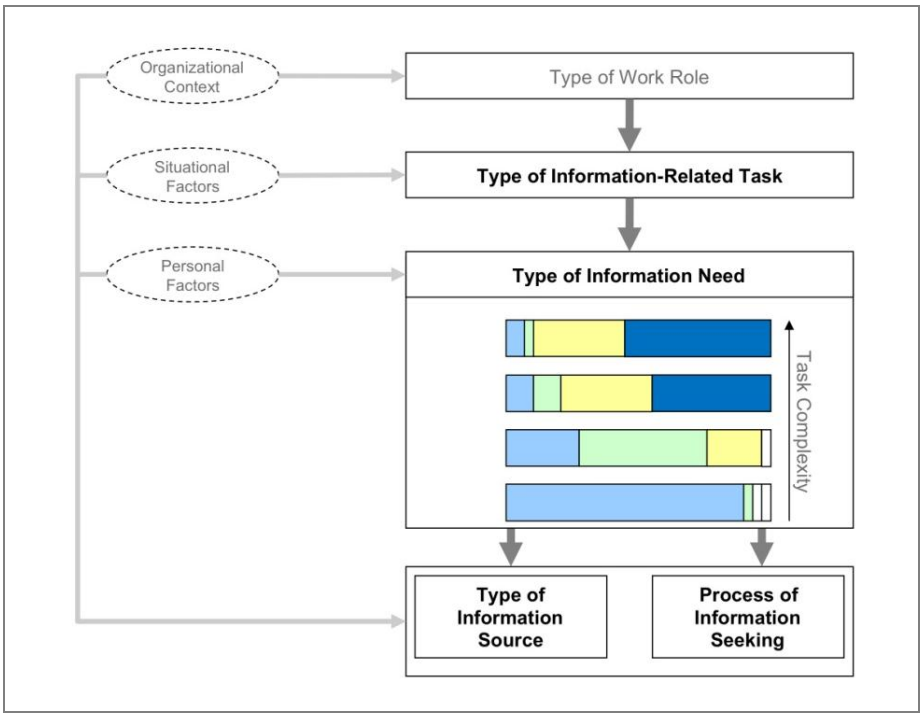


Figure 35 Analytical framework for modeling the information seeking behavior (adapted from Wilkinson 2001)

This framework expresses the understanding that it is essential to draw attention to context and influencing factors of an individual and his task, when modeling the process of information seeking. This means that, if employees are confronted with an information extracting task, the type of information they seek, the channel they choose to seek in and the way they proceed in their search will vary from a situation, where they are confronted with a more complex unstructured exploration task. As the exploratory study has shown, the task complexity and the type of information are essential factors influenc-

ing the way young professionals in management consulting seek information. Even though other contextual factors may be omnipresent, these are the two most dominant and therefore were focused in the further course of this study (as highlighted in figure 35).

The importance of an adequate process representation of the activities an individual engages in when being confronted with a new task has been highlighted by the findings from the fit-gap analysis (see section 5.3.1). The right level of detail, the respective scope and sequence of activity (especially regarding iteration) need to be taken into account when modeling the process of task-based information seeking behavior of young professionals in the given context. Thus, the phases of information seeking developed in section 5.3.1 were used to represent the process of activities that young professionals in management consulting most commonly engage in when being confronted with a new task.

These two central findings from the analysis of existing INSU research, its conceptual shortcomings and its validity for the research interest of this doctoral dissertation led to the conclusion that a context-specific process model of task-based information seeking behavior of young professionals in management consulting was required, which served as hypothetical model for the further empirical study. Following these requirements, the sequence of the phases needed to be arranged depending upon the type of the task or problem, which confronts the individual in the respective scenario. It furthermore needed to allow for iteration as linear models of information seeking have proven to be too rigid. As Byström and Järvelin (1995) have discussed, the interrelation of these factors is central to understanding information seeking behavior in all its aspects. It also represents a core prerequisite for the further analysis of the role of certain types of information sources, such as social software applications.

Figure 36 presents such a context-specific model of task-based information seeking, which meets all of the mentioned demands and thus built the foundation of further steps within this doctoral thesis. Following the task types developed earlier (see section 5.3.2), this model distinguishes between tasks with a high degree of *a priori* determinability regarding the information and process needed to solve it as well as its expected result.

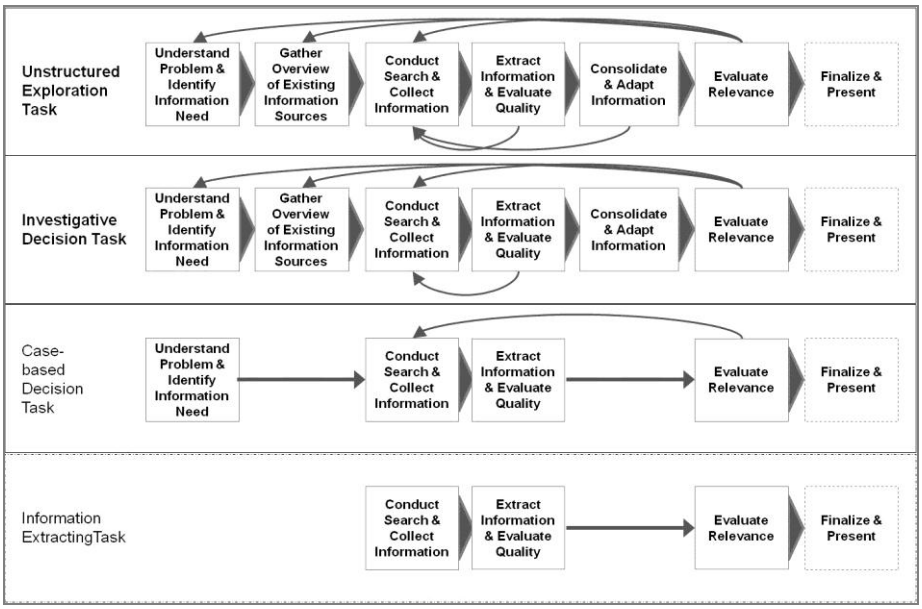


Figure 36 Context-specific model of task-based information seeking behavior of young professionals in management consulting

Accordingly, an information extracting task does not include all of the above mentioned phases of information seeking. A linear three-step process of information seeking is undertaken. Since the problem at hand is well understood, the information need is known and the way to approach this task is obvious, individuals instantly conduct a search and collect information. They extract the gathered information and evaluate its quality. Then, they finalize and present the result for the task at hand. In correspondence with Byström's findings (see figure 34), it is assumed that task information is the most dominant information type in this process. The simplicity and linearity of this sequence reveals the potential to have such a task solved automatically (as Byström and Järvelin (1995) pointed out in their original classification).

As defined in section 5.3.2, the information needed for completing a case-based decision task and the process of how to approach it, are partly indeterminable. The individuals confronted with this type of task, accordingly, first need to gather information in order to understand the problem and identify their information need. In addition to the activities relevant for solving an information extracting task the evaluation of relevance of the gathered information for the identified problem is required. This activity may lead to the conclusion that further search is necessary. Thus, these process phases may

be repeated until the task is solved (as expressed by the backward arrow). While task and task-solving information are assumed to be the most dominant types of information for understanding the problem and evaluating the relevance of the gathered information, factual information is mostly required when conducting the search and extracting information.

The investigative decision task is largely unforeseeable and so are its information requirements. Accordingly, young professionals in management consulting engage in all of the information seeking phases defined in section 5.3.1. Their most common sequence of activities is to understand the problem and identify the information need, gather an overview of existing information sources, conduct a search and collect information, extract the gathered information and evaluate its quality, consolidate and adapt the information, evaluate its relevance and finalize and present the results. Due to the large amount of information required, multiple searches may be conducted after having extracted the gathered information (represented by the backward arrow from 'extract information & evaluate quality' to 'conduct search & collect information'). The final evaluation of relevance of the gathered information may cause a reconsideration of the identified information need and the overview of existing information sources or directly lead to a new search. A variety of different information types is assumed to be required as the individuals need to engage in a large amount of investigative activities in order to identify the right information sources and extract relevant information that provide a basis for deciding how to approach the task and create the result. Especially social information is assumed to play an important role when gathering an overview of existing information sources, conducting the search and collecting information, as well as evaluating the relevance of the gathered information, since permanent procedures for performing the task have not yet emerged.

Young professionals in management consulting who are confronted with an unstructured exploration task, engage in all of the above mentioned phases of information seeking. These activities, however, primarily aim at structuring the problem, which results in an even higher degree of iteration and is assumed to require only little factual information and more task-solving and social information. This type of information enables the individuals to structure the problem and divide into sub-tasks that are of less complexity. The entire process of information seeking, however, is highly self-directed and requires a rich variety of information types.

The more complex task types at the top of the model, investigative decision tasks and unstructured exploration tasks, are assumed to be the most relevant categories for the purpose of this study, since they were prevalent in the gathered scenarios of information seeking. Furthermore, the nature of these tasks (in terms of complexity) in general can be considered to be most relevant for the workplace environment of young professionals in the given context, as it was characterized in section 1.1. Obviously the presented model contains differentiations regarding the types of information-related tasks, required information, activities of information seeking and their sequence or interrelation, which are crisper in theory than they may appear in reality. However, in order to come to an understanding whether social software applications may be used as information sources in the workplace and if yes, when and how to include them in the information environment, this type of conceptualization served as an essential instrument for conceptualizing the observed and deriving working hypotheses. Therefore, this framework guided the working hypothesis presented in section 6.1.

5.5 Summary

It was the goal of the qualitative exploration to gather a deep understanding of the context of management consulting and the information seeking behavior of young professionals. This objective was accomplished by the gathered rich amount of qualitative data that describes the typical work task situations and information seeking scenarios in the workplace of management consulting. The confrontation of these observations, interviews and document analyses with existing theories and concepts within INSU research led to a variety of findings.

First of all, the context of knowledge-intensive business services seems to be coined by unstructured and complex work tasks that require a large degree of self-directed information seeking. The way young professionals solve these information-related tasks may be described by a highly iterative process of seven phases. The sequence of these activities varies depending on the degree of task complexity. Based on the observations and previous research it was assumed that young professionals perceive most information-related work tasks in their daily management consulting work as rather complex,

thus to be either investigative decision tasks or unstructured exploration tasks.

Furthermore, it was hypothesized that analysts or consultants in management consulting require different types of information and seek information in different sources according to the complexity of their information-related work task. Due to the high complexity and low degree of repetitiveness of their work tasks, they seemed to seek particularly for social information in order to solve their common information-related work tasks.

Finally, the exploration has revealed that the information environment at the workplace of young professionals is very diverse and contains social web as well as social intranet services. Previous studies have shown that members of a new, emerging young generation of employees show a high degree of familiarity with social web applications. This led to the assumption that young professionals in management consulting also reveal a high familiarity with social software and use them as source of information for professional as well as private purposes.

Based on the identified characteristics of social software applications and the provided information, the integration of such social information sources promised to bear the potential of supporting young professionals in seeking information for their most common daily work tasks. One of the key questions, however, remained how to integrate these types of sources meaningfully into an existing information environment in order to reach their maximum potential and user acceptance. In order to come to the respective answers and validate the qualitatively developed hypotheses, the way young professionals use information sources in management consulting needed to be assessed quantitatively. This was achieved by employing the here developed conceptual model for a context-specific survey of task-based information seeking behavior.

6 The context-specific use of information sources in management consulting

By having drawn a detailed picture of the information seeking behavior of young professionals in management consulting, the conceptual model developed in chapter 5 prepared the ground for a context-specific survey of the use of information sources in the workplace. Thus, instead of simply assessing the frequency of use for different types of information sources, it was possible to derive detailed working hypotheses and respectively design an online questionnaire that takes into consideration workplace conditions, types of tasks, activities of information seeking and the existing information environment characteristic for the context of the study's participants. Chapter 6 presents the results of this quantitative survey and provides a detailed overview of the current role of various sources of information, the satisfaction of analysts and consultants with the information environment at the workplace and their usage of social software for private and professional purposes. As a prerequisite, section 6.1 describes the working hypotheses that guided this empirical study and gives an overview of the employed online questionnaire and gathered sample. Then, the survey results are presented, starting with the perceived complexity of common work tasks in management consulting in section 6.2 and a description of the typical workplace environment of the participants of this study. Following this, section 1.1 characterizes the information needs of young professionals in management consulting. Based on these findings, the usage behavior of the different sources of information was surveyed as a function of task complexity and the respective phase of information seeking. As a result, the context-specific findings of task-based information seeking behavior of the subject group of this study are presented in section 1.1. Finally, section 1.1 reflects upon the main results in regards to the developed working hypotheses and summarizes the context-specific use of information sources in the workplace of young professionals in management consulting.

6.1 Method and Sample

Based on the findings from the qualitative exploration providing the required theoretical framework, central concepts and context-specific model describing the task-based information seeking behavior and the workplace context of young professionals in management consulting, the use of information sources was assessed in a quantitative study (see figure 37).

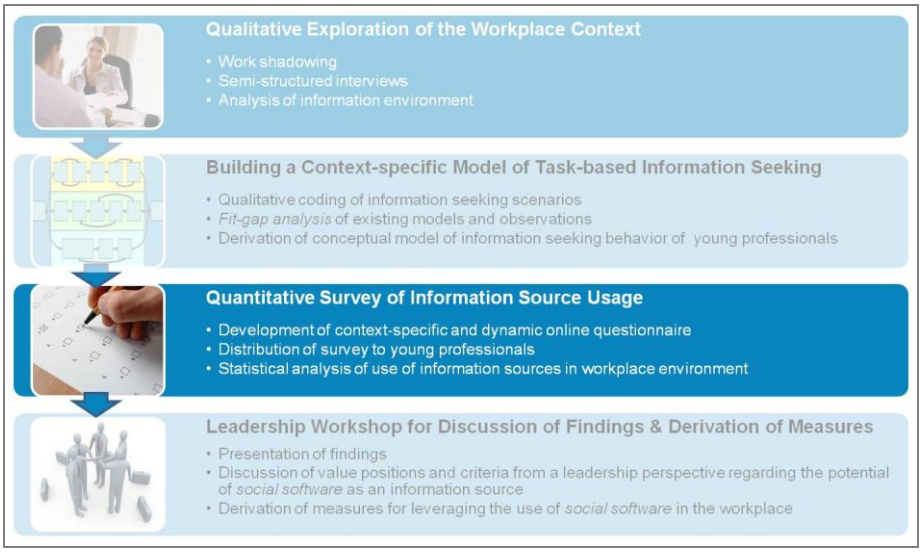


Figure 37 Quantitative survey of information source usage

These concepts enabled the context-specific design of a subsequent quantitative survey regarding the relevance and usage of information sources in the information seeking behavior of young professionals in management consulting. In order to guide this survey the following working hypotheses were derived from the qualitative exploration:

Table 10: Overview of working hypotheses

WH 1	Young professionals perceive most information-related work tasks in their daily management consulting work as rather complex, thus to be either investigative decision tasks or unstructured exploration tasks.
WH 2	Young professionals in management consulting require different types of information and seek information in different sources according to the complexity of their information-related work task.
WH 3	Due to the high complexity and low degree of repetitiveness of their work tasks, young professionals in management consulting seek for task-solving and social information in order to solve their common information-related work tasks.
WH 4	Young professionals in management consulting show a high familiarity with social software applications and use them as source of information for professional as well as private purposes.

These hypotheses enabled the design of the survey in regards to items, scales and required sample and represented the foundation for the first part of the quantitative study. Its main focus was the validation of the findings derived from the qualitative methodical steps as well as analytical considerations described in chapter 2 and 3. The second part then aimed at surveying the use and relevance of the different information sources for the respective activities of information seeking identified above. In order to achieve these goals, the survey contained the following items:

Table 11: Items of online questionnaire

ID	Item	Questions
I.1	Organizational background	*Q1, Q2, Q3*
I.2	Daily work environment	*Q4*
I.3	Types of tasks in management consulting	*Q5, Q6*
I.4	Types of information in management consulting	*Q7*
I.5	Sources of information in management consulting	*Q8, Q9*
I.6	Satisfaction with current work environment	*Q10, Q11, Q12*
I.7	Usage of social information sources	*Q13, Q14*
I.8	Demographic information	*Q15, Q16, Q17*

The majority of questions provided multiple or single choice answers on either a nominal or Likert-scale. Thus, descriptive statistical measures such as mean values and standard deviation were employed. For this step, standard

tools such as *SPSS* and *MS Excel* were used. The data analysis of this survey resulted in a quantitative overview of information needs, seeking and use of the described target population in the given work context. The current role of social software and other sources of information in the workplace environment was captured in accordance with the developed context-specific model of task-based information seeking and provided the foundation for the subsequent considerations.

With respect to *I.1*, first demographic details regarding the organizational background were collected. This included the organizational alignment to a service line, the current job level, as well as the length of service with the company. Together with questions regarding gender, age and geographic alignment (*I.8*), these questions aimed at characterizing the survey sample. The participants were then asked to indicate to what extent their daily work environment (*I.2*) tended to be either on one side or the other of a 7-scale continuum describing the subject of their project work, their work location, their technical means and the degree of self-control over their work tasks. Answers to these questions provided a further description of the common work environment of young professionals in management consulting, which plays an important role for any consideration regarding the design of their electronic information environment.

In order to assess the degree of complexity and *a priori* determinability of daily work tasks, *I.3* consisted of two questions. While both had the same research interest, they differed significantly in terms of their methodical approach. The first of these questions asked the participants, which of a selection of given task scenarios represented the complexity of their daily work tasks in management consulting best. The use of such scenarios has been employed by Bell and Ruthven (2004), who also used narrative descriptions of artificial tasks with varying task complexity. This method allows 'translating' abstract concepts into the language and reality of the participants. Thus, they were asked to imagine a certain work situation by the following choice of words:

> "Imagine you are asked by your client or colleague to create an overview presentation of the Latin-American smartphone market for a potential entry strategy ...".

Then a selection of scenarios was offered based upon the insights into the daily work of young professionals in management consulting, which was gathered in the qualitative exploration phase and validated with participants of the target population in a pre-test. This also applied to the different levels

of complexity, which were represented in the different scenario choices as follows:

> *Scenario 1: very structured*
>
> You are given a pre-assembled presentation, where only final facts on population statistics and market size are missing. You are pointed to a report, which contains the missing information and asked to extract the missing data in order to fill it into the presentation.
>
> *Scenario 2: structured*
>
> You are given a pre-assembled presentation, where the general structure is already specified but the needed information is not obvious right away. In order to decide which information is relevant and how to present it, you are given deliverables from related tasks, which serve as valuable examples.
>
> *Scenario 3: unstructured*
>
> You are told that an overview presentation in a certain format is expected, but you will need to gather related deliverables from previous tasks for yourself in order to understand what exactly the presentation is supposed to look like. At this point of time it is mostly unclear to you which information is required in order to solve the task.
>
> *Scenario 4: very unstructured*
>
> What exactly is expected from you, however, initially remains unclear. You need to find out for yourself what the expected outcome is supposed to look like, develop your own approach on how to get there and identify the information you need in order to succeed.

The rationale along the differentiation of these scenarios is implicitly based upon the dimensions of task complexity defined by Byström and Järvelin (1995) (see section 3.2.2). As a result, the question described above revealed which of these scenarios described the common task complexity in the workplace of the subjects best. In order to avoid a strong influence of the fictitious example and a possible falsification of answers, a second question was added to survey the types of tasks in management consulting. Explicitly applying the mentioned dimensions of varying structuredness, participants were asked on a 5-point Likert scale (‘not aware’ – ‘fully aware’) to indicate how aware they initially tend to be of:

- the information required to solve the respective task,
- the process required to solve the respective task and
- the structure of the expected result of the task.

Both questions furthermore provided a free text field for additional comments to explain the participants’ choice or provide further insights regarding the complexity of common daily work tasks. Since the model of information

seeking described in section 1.1 considers task complexity to be a relevant factor for the determination of information seeking activities that a cognitive actor engages in and their sequence of occurrence, these questions represented a conditional control of the latter items *I.5* and *I.6* (described further below).

I.4 assessed the general relevance of different types of information for the common work tasks of young professionals in management consulting. Therefore, the participants were asked to indicate on a 5-point Likert scale ('never' – 'very often') how often they are in need of the different types of information defined in section 5.3.3, when being confronted with a new task. Even though these theoretical information types were described in a short abstract, the option 'don't know' was offered, since it could not be assumed that these general concepts were understood by each participant. Having gathered feedback on these rather theoretical concepts defining the participants' context, the following questions aimed at collecting statistics on the frequency of use of information sources and their satisfaction with the current information environment. *I.5* consisted of two questions: First of all, participants were asked how often (5-point Likert scale) they turned to the various sources of information (based on the categorization developed in section 5.3.4) in order to solve their most common daily work tasks in general..

In addition to this rather general question, participants were asked which of these sources they used for the respective phases of information seeking. This represented the central element of this questionnaire, since it merged the findings from the qualitative exploration with quantitative data regarding the use of information sources. As mentioned earlier, this question was constructed depending on the answers provided to *I.3*. Based on the selected scenario of common task types in management consulting (*Q5*), the relevant phases of information seeking were displayed. This was necessary in the sense of the developed framework. That way the participants were only questioned in regards to the use of information sources for phases they could be expected to regularly engage in[46]. Figure 38 visualizes this conditional logic of the online survey:

46 The relationship between task complexity and the process of information seeking is described in section 1.1 in further detail. Here the focus shall be the dynamic and context-sensitive nature of the online questionnaire based on its conditional logic.

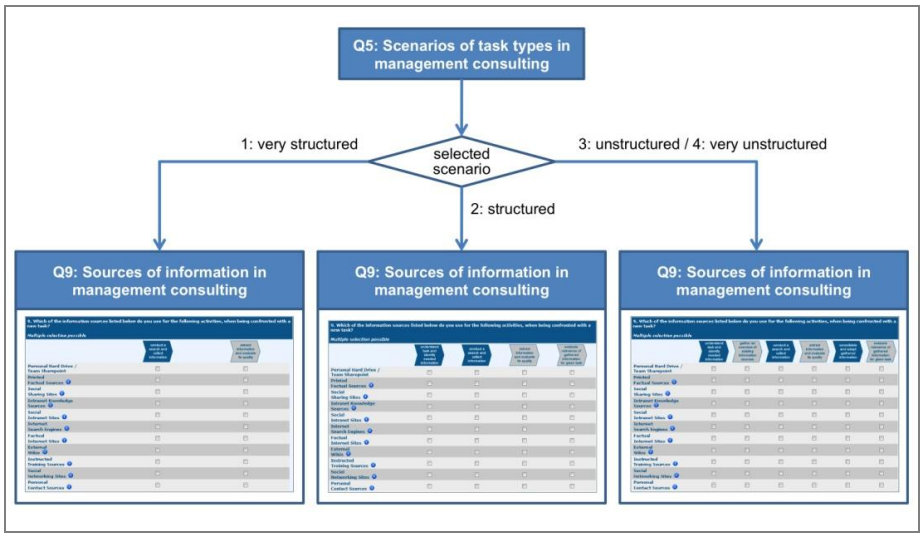


Figure 38 Conditional logic of online questionnaire

This logic was also applied when participants were asked, how well the overall information environment at their workplace supported them in their information seeking phases (*I.6*). According to the categorization of their most common type of task, respondents were only asked to describe their level of satisfaction (on a 5-point Likert scale) for those activities of information seeking that the theoretical model (see figure 36) implied for their context. *I.6* furthermore included a question regarding the electronic information environment in specific and offered a further text field for the description of aspects of this environment, participants would like to see improved. Finally, *I.7* aimed at collecting information on the familiarity with and use of social information sources. This item was split in two by asking respondents, how often they visited such information sources for professional purposes (e.g., when having a work-related question) and how often for private purposes (e.g., when having a non-work-related question, for entertainment, private interest). Answers were given in regards to the following categorization of social information sources[47]:

- internal blogs
- external blogs

47 Along the lines of the categorization of social software by Ebersbach et al. (2008) described in section 2.1.1.

- internal wikis
- external wikis
- internal social sharing sites
- external social sharing sites
- internal social networking services
- external social networking services

on a 5-point Likert scale ('never' – 'very often') as well.

The collection of statistical data for these items was realized in an online questionnaire based on the open source software: '*limesurvey*'[48]. This allowed reaching the widely dispersed target population of analysts and consultants in the geographical units of ASG and NA within *Accenture Management Consulting*. It furthermore enabled the anonymous collection of responses in a digital and easy-to-process format. The survey platform was set up on a corporate-owned application server, which guaranteed data security and promoted a confidential environment to *Accenture* employees. To further support this aspect, the call for participation was distributed from *AMC* senior executives via internal mailing lists. These measures were taken in order to optimize data security, trust and finally meant to optimize the response rate of the survey. As Tomaszczyk (2008) noted in a methodological literature review, response rates for web surveys are typically low. Nevertheless, an overall response rate of 16% was achieved in spite of the attested non-committal nature of such electronically distributed calls for participation and the mostly limited availability of the members of the target group due to the high strain of client-facing project work. A further benefit of employing an online questionnaire was the dynamic design of question groups. Thus, conditional questions were included in order to realize the multi-level nature of the developed context-specific model of task-based information seeking as described earlier.

As explained before the survey was targeted at analysts and consultants within the *Accenture Management Consulting* workforce in the North American (NA) as well as German-speaking (ASG) business units. Overall an adjusted participation of n = 115 was accomplished. Of these 115 participants 62 (54%) were part of ASG, while 53 (46%) were from the North American workforce. The sample was also quite evenly distributed regarding

48 A commonly used open source PHP web application to develop, publish and collect responses to online and offline surveys – http://www.limesurvey.org

the gender of the employees, since 56 (49%) female and 59 (51%) male respondents took part in this survey. Regarding the age of the participants a total of 20 responses were excluded from the sample in order to restrict the subject group of this study to young professionals of 32 years of age and below. In the resulting sample 44% of the participants were between 25 and 28 years old. The second largest group (41%) consisted of employees between 29 and 32 years of age. Finally, 13% of the respondents were 24 years old and younger. Thus, the sample of this survey resulted in an average age of 27.68 years and represented the target group of young professionals born between 1978 and 1988.

In addition to these demographic figures, the position and function of the respondents within the organization of *Accenture Management Consulting* (see section 4.1) was surveyed. Regarding the career level, the sample of this study consisted of 40% analysts and 60% consultants. In order to better understand the experience of the participants, their years of corporate affiliation were assessed. As figure 39 reveals, most of the employees (43%) had been between two and four years with the company at the time of the survey, while only 15% were fairly experienced with more than four years of corporate affiliation.

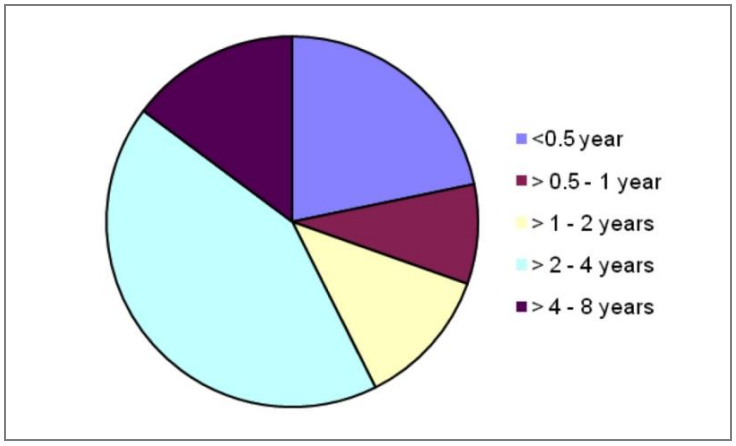


Figure 39 Corporate affiliation of the participants (n = 115)

The large share of participants below this degree of years of service, however, reveals that the sample may be characterized as fairly inexperienced. 22% of the employees had entered the organization less than half a year before the time of the survey. Together with those in between six and twelve

months of corporate affiliation (9%) and those in their second year at *AMC* (12%), this amounted to an equal share of 43% of the respondents that had only joined the firm in the past two years. As a final element to characterize the sample of this study, the alignment within the organization was surveyed. A wide spread across all of the functional service lines was accomplished (see figure 40). 48 participants were aligned to '*Talent & Organization Performance*' (T&OP), one of the largest groups within *AMC*, 18 to '*Customer Relationship Management*' (CRM), 16 to '*Strategy*', 15 to '*Supply Chain Management*' (SCM) and 12 to *'Finance & Performance Management*' (F&PM). The service line '*Process & Innovation Performance*' (P&IP) was represent by only three participants. However, since this department was a fairly new and very small group of employees at the time of the survey, this expressed the organizational distribution of weight quite well.

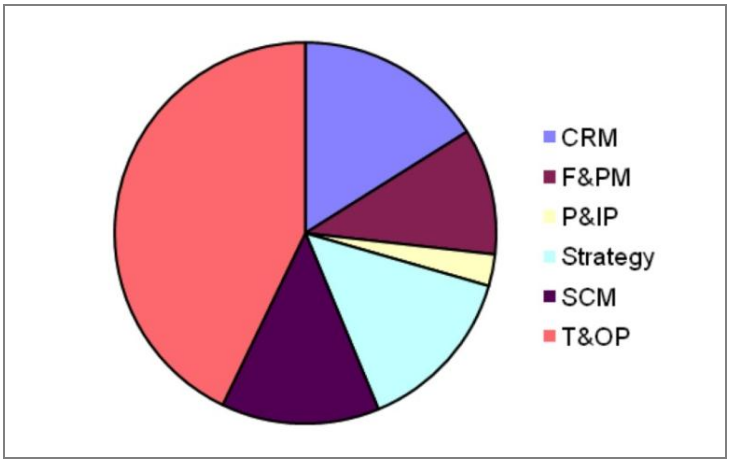


Figure 40 Functional alignment of participants within AMC (n = 115)

The collected study sample allowed the empirical analysis of the above developed hypotheses and thus provides answers to the research questions created in section 1.1 regarding young professionals within their first career years in different functional areas of management consulting. As the study focused on participants from North America and German-speaking countries, possible cultural differences may be reflected in this survey but only to a certain degree since data from further countries, e.g., the Eastern hemisphere, were not gathered. Further considerations regarding the validity and limitations of the following results may be found in section 1.1.

6.2 Workplace environment and common types of tasks

The workplace environment of management consulting proved to be characterized the way described in section 1.1. It is a project-based and client-centric industry and its employees are highly dependent upon digital resources to be able to perform their knowledge-intensive work roles. This is expressed by the display of the given responses on the semantic differential of *I.2* in figure 41. Asked about the type of work young professionals typically engage in, the mean response value expresses that it is mostly client-related project work (M = 1.90 / SD = 1.16).[49] Accordingly, it is mostly located at a client's site and requires that the employees adapt to new physical work environments from project to project (M = 2.04 / SD = 1.33). This highlights the importance of digital resources, since it is not possible to equip one's desk or office with permanent possessions. The fact that the work in management consulting was almost exclusively described by the participants to be performed with a PC or laptop further expresses this characteristic (M = 1.53 / SD = .78).

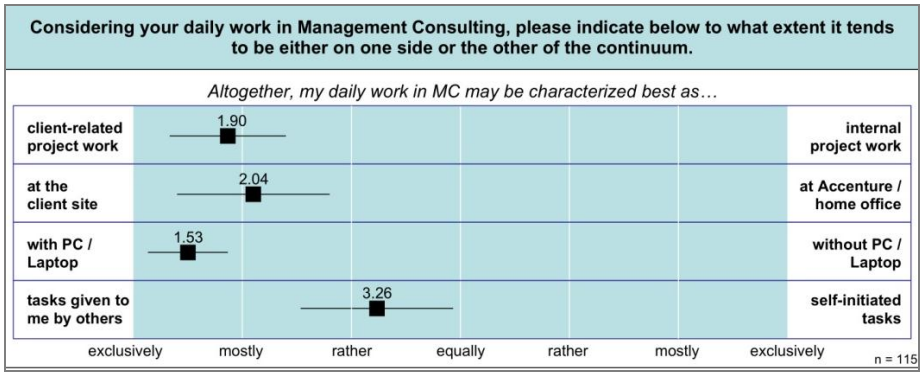


Figure 41 Characterization of the workplace environment in management consulting

Since the focus of this thesis lies on the task as trigger of information seeking activities, respondents were asked whether they initiated most of their

49 The 7-point differential scale ('exclusively' – 'equally' – 'exclusively') displayed in figure 41 was scored from 1 (on the left hand side of the differential) to 7 (on the right hand side). The displayed values represent the mean values across all participants of the study and presume the scale to provide even intervals.

daily work tasks independently or whether they were mostly given to them by others. The responses show that tasks are rather given to young professionals than self-initiated (M = 3.25 / SD = 1.36). This category, however, revealed the highest standard deviation which may be explained by the different career levels within the sample of this study. As laid out in section 4.1, the role expectations vary slightly between analysts and consultants within management consulting. While analysts are expected to perform rather operative and research-related tasks that require little initiation, consultants are considered to be able to act more proactively. In correspondence with these differences in career levels, consultants replied that most of their daily work tasks were almost equally self-initiated and given to them by others (M = 3.58 / SD = 1.32) and analysts characterized their work tasks to be rather given to them by others (M = 2.79 / SD = 1.14). Still, these mean values characterize the workplace environment of young professionals quite unanimously and provide a good understanding of the overall context of their daily work tasks.

Regarding the characteristics of the respective tasks, the participants were asked to choose which scenario best described the type of task the employees are most typically faced with (see page 223 for the detailed scenarios). Each of the described scenarios stood for one of the task types developed in section 5.3.2. As table 12 reveals, the majority of analysts and consultants (70%) characterized their most common type of work task to be an investigative decision task. The categories ‘unstructured exploration task’ and ‘case-based decision task’ were both chosen by 16 respondents each, while only 3 participants said their tasks were mainly ‘information extracting tasks’, i.e., of low complexity. Due to the little relevance for the research interest of this study, this last category was not further taken into consideration. According to the conditional logic presented in figure 38, however, the other three most common types of information-related work tasks in management consulting served as differentiating variables for the data gathered in the subsequent part of the survey.

Table 12: Types of tasks in management consulting

Types of tasks (*Q5*)	n = 115
Information Extracting Task (IET)	3
Case-based Decision Task (CBDT)	16
Investigative Decision Task (IDT)	80
Unstructured Exploration Task (UET)	16

As elaborated before, the main differentiating attribute of these categories is the degree of *a priori* determinability as defined by Byström and Järvelin (1995). Therefore, respondents were additionally asked to illustrate how aware they initially tend to be of the respective elements of a task when being assigned to a new work task. Figure 42 summarizes the mean values of these responses and compares the replies according to the type of task participants had previously chosen to be most representative for their daily work in management consulting.[50]

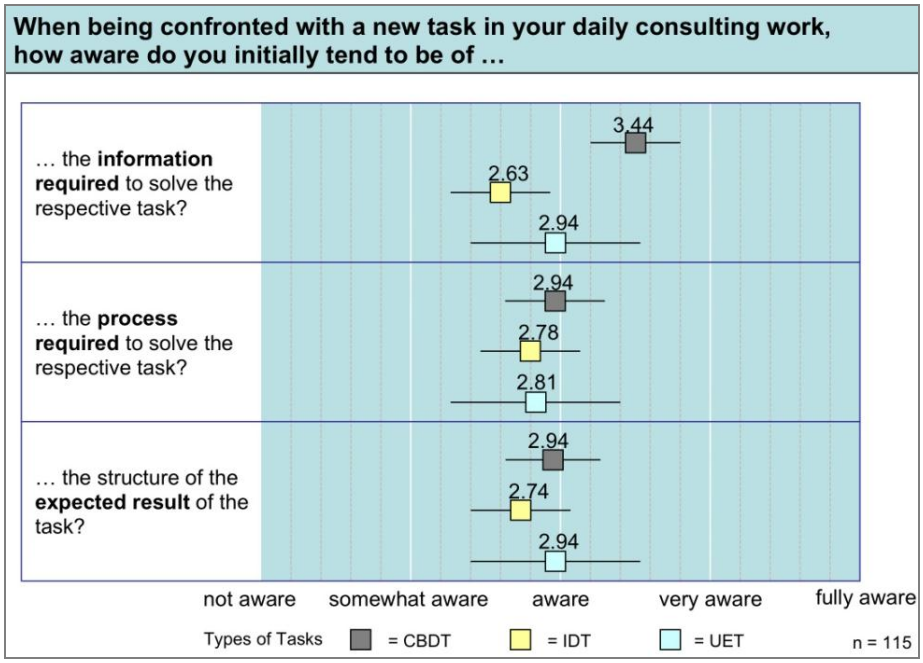


Figure 42 A priori determinability of daily work tasks in management consulting

Altogether, respondents replied on a 5-point scale from ‘not aware’ (1) to ‘fully aware' (5) whether they are generally aware of the needed information (M = 2.79 / SD = .84), the required process (M = 2.80 / SD = .80) and the expected result (M = 2.81 / SD = .85) when being confronted with a new task. This may be seen somewhat in line with the choice of scenarios in the previ-

50 The 5-point Likert-scale (‘not aware’ / ‘somewhat aware’ / ‘aware’ / ‘very aware’ / ‘fully aware’) displayed in figure 42 was scored from 1 to 5. The displayed values represent the mean values across all participants of the study and presume the scale to provide even intervals.

ous question, indicating a certain degree of uncertainty and complexity. The accumulated mean values, however, remain quite centered on the spectrum and thus do not allow for definitive interpretation. This changes when the data is analyzed with respect to the previously chosen scenario of task complexity. This perspective indeed revealed that employees that are typically confronted with more complex daily work tasks are much less aware of the needed information (IDT M = 2.63 / SD = .77; UET M = 2.94 / SD = 1.12) than those who characterized their work to consist of mainly less complex case-based decision tasks (CBDT M = 3.44 / SD = .51).

While this proves the practical task type scenarios to be consistent with the theoretical concept of task complexity, the further data appears more ambiguous. The accumulated mean values of the respective elements of *a priori* determinability do not consequently decrease from case-based decision task (M = 3.10 / SD = .69) to investigative decision task (M = 2.71 / SD = 0.76) to unstructured exploration task (M = 2.90 / SD = 1.13). This means that those participants who chose the most complex work task scenario (UET) do not necessarily perceive the lowest degree of *a priori* determinability. The high value of the standard deviation of this share of the sample, however, indicate that a careful interpretation of these mean values is required. Furthermore, the low variance of awareness between the three different elements of a task as defined by Byström and Järvelin (1995) raises the question whether the respondents were able to follow the tripartite differentiation of uncertainty. Altogether, the ambiguity of the data of this category may be considered to be the result of a cognitive overload caused by the highly abstract concept of *a priori* determinability. Thus, the scenario-based indication of common types of tasks (*Q5*) in management consulting was instead chosen as differentiating factor for the further analysis of the empirical data.

Based on these figures the developed hypothesis regarding the complexity of common information-related work tasks (*WH1*) is confirmed. Young professionals in management consulting are mostly engaged in client-related project roles, which require them to work in ever-changing work environments and increase their dependence upon digital technologies. The tasks they are most commonly confronted with are rather given to them by others (e.g., client or supervisor) than initiated independently. Furthermore, the large majority of participants of this study indicated that these tasks are typically investigative decision tasks, which require a large amount of investigative activities in order to identify the right information sources and extract

relevant information in order to found decisions on how to approach the task and create the expected results.

6.3 Information needs in the workplace of management consulting

The characterization of the workplace in management consulting was continued by examining the type of information needs of young professionals. As presented in section 5.3.3, the qualitative observation of analysts and consultants in management consulting revealed four different types of information relevant for solving their common information-related work tasks. These are task information, factual information, task-solving information and social information. As figure 43 displays on the basis of the mean values regarding the need of each type of information, the assumption that the type of information need varies depending on the type of task (*WH2*) may be slightly supported by the data of the quantitative study. Employees that are mainly confronted with less complex case-based decision tasks, for example, tend to be mostly in need of information regarding the specific requirements of a task (M = 3.63 / SD = .72).[51] For analysts and consultants that described their typical work task to be an unstructured exploration task, task information carried much less weight (M = 2.75 / SD = .92). Other types of information such as factual information interestingly were declared to be needed more often in such situations (M = 3.88 / SD = .96). There is, however, no consistent tendency towards one specific type of information in relation to the different types of task.

51 The 5-point Likert-scale displayed in Figure 43 was scored from 1 (‘never’) to 5 (‘very often’). The displayed values represent the mean values across all participants of the study and presume the scale to provide even intervals.

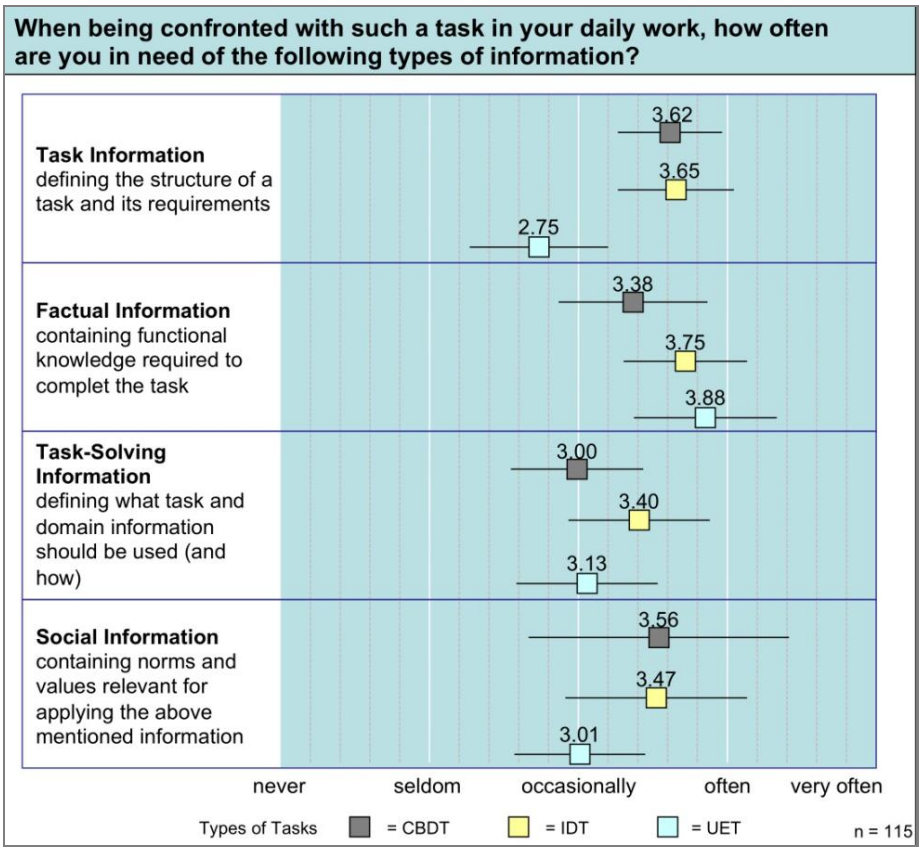


Figure 43 Types of information needed in management consulting

Regarding the most relevant type of task for the subject group and research interest of this doctoral dissertation (IDT), the following can be extracted from the analysis of the data of this item. When being confronted with an investigative decision task in management consulting, young professionals seek all of the identified types of information but with slightly varying regularity, i.e., intensity: factual information (M = 3.75 / SD = .83), task information (M = 3.65 / SD = .78), social information (M = 3.40 / SD = 1.06) and task-solving information (M = 3.40 / SD = .95). While the statistical variance between the different types of information did not allow for any further conclusions, the overall relevance of all types of information for the subject group of young professionals in management consulting was confirmed. This is expressed by the fact that participants of the survey indicated that they are occasionally, often or very often in need of task information (90%), factual

information (89%), task-solving information (78%) and social information (76%), when being confronted with a new task in general. There is, however, no proof for a specific relevance of task-solving and social information for solving investigative decision tasks (WH3). These observations conclude the analysis of the workplace environment, the common work tasks and types of information needed in management consulting. Based on these findings, the subsequent results of young professionals' use of information sources may be interpreted with the appropriate contextual background information.

6.4 Young professionals' use of information sources

While the previous sections of the study concentrated on characterizing the context of the sample group, the following items of the questionnaire surveyed their use of information sources. Based on the responses of the participants, the general (subjective) relevance of the different categories of information sources were derived. These figures are presented in section 6.4.1 across all levels of task complexity and regardless of further details in respect to the different phases of task-based information seeking. The true value of the preceding methodical steps for the development of a conceptual model and a deeper understanding of the context of use and activities of information seeking, however, is revealed when considering the survey results presented in section 6.4.2. There the use of information sources is put into context regarding the complexity of the task and the phase of information seeking. Thus, it may be analyzed, which source of information is considered most frequently for which type of task and for which type of activity in the entire process of seeking information. This is complemented by the perspective on the way young professionals use social software as a source of information (see section 6.4.3). In this section, most notably, the private information seeking behavior is contrasted with the professional usage of social software applications. Finally, the participants' degree of satisfaction with the current information environment and their suggestions for improvement are described in section 6.4.4 and conclude the presentation of results of the online survey. This leads to the summary of findings regarding the context-

specific use of information sources in the workplace environment of young professionals in management consulting (see section 1.1).

6.4.1 Overall use of information sources in the workplace

In order to come to a first understanding of the role of different information sources and their frequency of use by the participants of the study, the overall usage across all levels of task complexity shall be presented. This provides an overview of the general relevance of all of the information sources in the information environment of the given workplace context. Accordingly, participants were asked how often they turned to the various sources of information in order to solve their most common daily work tasks in general (*Q8*). Altogether, the accumulated responses reveal a diverse use of the information environment and a high degree of overall information source usage. This needs to be examined in detail, however, in order to understand the current relevance of the different categories of information sources for the daily workplace environment of young professionals.

On the one hand, the results indicate that management consultants refer to a large variety of information sources in their need to solve their common work tasks in total. Almost all of the identified information sources are used in order to seek information (see table 13), many of which on a regular basis.

Table 13: General frequency of use of information sources

Information source category	M	SD
Personal Contact Sources	4.10	.95
Internet Search Engines	4.01	.94
Personal Hard Drive / Team *SharePoint*	4.01	1.04
Intranet Knowledge Sources	3.69	.92
Factual Internet Sites	3.44	1.08
External Wikis	2.90	1.00
Instructed Training Sources	2.40	1.23
Printed Factual Sources	2.37	1.03
Social Intranet Sites	2.21	.98
Social Sharing Sites	1.86	1.00
Social Networking Sites	1.71	.94
1 = never / 2 = seldom / 3 = occasionally / 4 = often / 5 = very often // n = 115		

On the other hand, a divided image regarding the frequency of use of the various types of information sources categorized above may be observed. There are some sources that prove to be most relevant in the workplace environment of young professionals, while others are used rather seldom. Above all, personal contacts are the most important source of information for young professionals in their daily management consulting work. 77% of the participants responded that they turned to their supervisors, peers, or clients often or very often (M = 4.10 / SD = .95) in order to seek information required to solve a respective task. This is the highest value in this category followed by that of internet search engines (M = 4.01 / SD = .94) or that of personal hard drives and team's network drives (M = 4.01 / SD = 1.04). 3 out of 4 respondents said to use internet search engines regularly in their daily work as management consultants. Also the personal hard drive or internal network drive are consulted by 73% of the sample group often or very often when seeking information in order to solve a specific work task. Other resources such as intranet knowledge sources (M = 3.69 / SD = .92) and factual internet sites (M = 3.44 / SD = 1.08) are also used regularly by 59% respectively 52% of the participants. The frequency of use of these resources, however, is very different from the before mentioned points of reference. Another source of information that is consulted occasionally or even more frequently by 57% of the young professionals are external wikis (M = 2.90 / SD = 1.00). This means that more than every second participant of the study declared to turn – at least occasionally – to an external wiki in order to seek information relevant to a respective work task.

While the six categories of information sources can be considered an essential part of the daily information seeking behavior of young professionals in management consulting, the following categories receive generally little attention. According to 53% of the participants' responses, instructed training sources (M = 2.40 / SD = 1.23) are used never or seldom as source of information when being confronted with a new task. While this can be partly explained by the fact that training materials or even classroom trainings require a high effort and typically do not cover the specific information need in a certain situation, the low frequency of use of the following categories stands out. 67% of the sample group indicated to never or seldom use social intranet sites (M = 2.21 / SD = .98) such as *Accenture*'s internal *People Pages*, *wikis*, *bookmarking* and *media exchange* occasionally or more when seeking information for their common work tasks. Even less participants reported to use services of the social web such as social sharing sites (M = 1.86 / SD = 1.00)

and social networking sites (M = 1.71 / SD = .94) for task-related information seeking. According to their replies about their use of information sources in the workplace in general (*Q8*), 77% (SSS) and 81% (SNS) of the respondents never or seldom turn to such public websites as *Delicious*, *Slideshare*, *YouTube*, or *Facebook* in order to seek information relevant for their respective work task. This aspect was further investigated based on the results of questions 13 and 14 of the survey regarding the use of social software applications (see section 6.4.3).

Altogether, the gathered data on the frequency of use of the identified categories of information sources provides a good overview of the daily acceptance and relevance of certain sources of information in the workplace environment in general. In which context and for which purpose these sources are used, however, may only be answered when considering the developed conceptual framework of task-based information seeking. The following section will therefore go into further detail and present the results of the following survey items as a function of task complexity and the respective phase of information seeking.

6.4.2 Context-specific source usage for task-based information seeking

In order to understand the use of information sources in the workplace of management consulting in further detail and ultimately be able to derive concrete recommendations on how to adapt the electronic information environment, young professionals were asked which of the information sources they used for the respective information seeking activities identified in the exploratory study. This led to an alignment of information sources with the typical phases of information seeking. According to the conceptual framework developed in section 1.1, the process of information seeking varies depending on the level complexity of a given task. Thus, the sample group was split according to figure 38 into respondents who indicated to typically be faced with case-based decision tasks (n = 16), investigative decision tasks (n = 80) and unstructured exploration tasks (n = 16).

As concluded in section 1.1, young professionals in management consulting typically engage in the following activities of information seeking, when being confronted with tasks that are still quite structured, but case-based arbitration plays a major role in them (CBDT):

- understand problem & identify information need
- conduct search & gather information
- extract information & evaluate quality
- evaluate relevance
- finalize & present.

Accordingly, the participants of the survey were asked which information source they typically consulted for each of these phases[52]. Since this question allowed for (multiple) checkbox selections of information sources per information seeking activity, the results may be summarized as that portion of total respondents indicating to use the respective source of information the particular phase (see table 14). Hence, the table may be read as follows: Of the respondents that categorized their common daily work tasks to be fairly structured and of rather little complexity (CBDT), 44% reportedly turn to personal contacts in order to understand the given problem and identify their information need.[53]

Altogether, those young analysts and consultants that perceived their common work tasks to be case-based decision tasks, reported to use an average of 11.81 (SD = 4.49) sources when seeking information. As in the previous item on the general use of information sources in the workplace (see table 13), the personal hard drive, internet search engines, intranet knowledge sources and personal contacts are among the most relevant sources of information. As highlighted throughout the entire thesis, however, the context-approach of surveying information source usage allows a much more detailed understanding of the seeking behavior of young professionals in management consulting.

From this perspective, table 14 shows, for example, that the participants turn to personal contacts rather in the early phases of solving a task. Internet search engines are mostly used in order to gather information.

52 The phase 'finalize & present' was excluded from this question item, since it is not primarily dependent upon further information sources.

53 The sum of portions per column as well as per row may be larger than 100, since respondents were not limited in aligning the use of sources with the respective phase of the task-solving process.

Table 14: Use of information source per information seeking activity (case-based decision tasks)

Q9 CBDT n = 16	Understand problem & identify information need	Conduct search & gather information	Extract information & evaluate quality	Evaluate relevance
Personal Contact Sources	44%	44%	31%	38%
Internet Search Engines	38%	81%	38%	19%
Personal Hard Drive / Team *SharePoint*	31%	63%	69%	56%
Intranet Knowledge Sources	31%	50%	44%	38%
Factual Internet Sites	6%	56%	31%	13%
External Wikis	13%	38%	31%	6%
Instructed Training Sources	25%	19%	13%	13%
Printed Factual Sources	13%	38%	38%	6%
Social Intranet Sites	13%	31%	0%	0%
Social Sharing Sites	6%	19%	6%	0%
Social Networking Sites	6%	25%	6%	0%

The personal hard drive or the network drive of the project team are mostly referred to when evaluating quality and relevance of the gathered and created information objects.

In order to summarize the findings of this section even better, a less granular level of detail is chosen. It enriches the visualization of the above developed context-specific model of task-based information seeking behavior (see figure 36) with the statistics gathered in *Q9* and the characteristics of information sources as categorized in section 5.3.4. The resulting visualization allows for a comprehensive display of the context-specific source usage

of young professionals for their information seeking activities of case-based decision tasks (see figure 44).

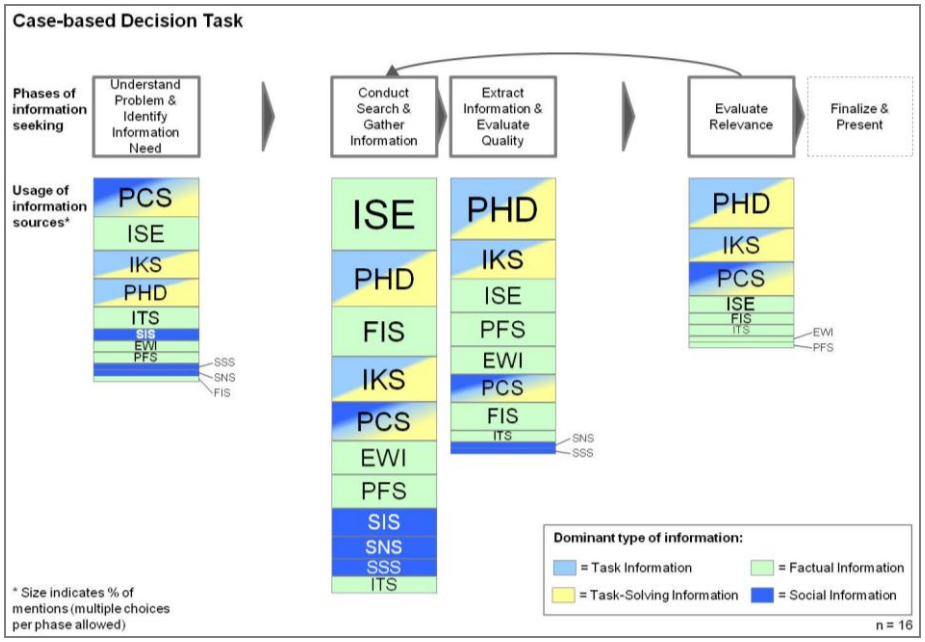


Figure 44
Context-specific source usage for information seeking of case-based decision tasks

First and foremost, the horizontal positioning of the categorical boxes[54] indicates in which phase of the information seeking process of case-based decision tasks the different information sources are used. The vertical alignment then expresses the order of mentions. Furthermore, the size of the respective information source categories stands for the portion of total mentions by the participants. This represents a third dimension of data interpretation: the overall intensity of information source usage per phase. Apart from pointing at the most relevant information sources as a function of the respective activities, the presented results also indicate the overall intensity

54 The abbreviations of the sources are used in order to allow for a compact visualization of data. These are: PCS – 'Personal Contact Sources'; PHD – 'Personal Hard Drive / Team's Sharepoint'; ISE – 'Internet Search Engines'; IKS – 'Intranet Knowledge Sources'; FIS – 'Factual Internet Sites'; PFS – 'Printed Factual Sources'; EWI – 'External Wikis'; ITS – 'Instructed Training Sources'; SIS – 'Social Intranet Sites'; SNS – 'Social Networking Sites'; SSS – 'Social Sharing Sites'.

of source usage for each phase of information seeking. Thus, it may be concluded from figure 44, that young professionals seek more intensively and across a wider range of information sources when conducting a search and gathering information compared to when they are in the process of evaluating the relevance of the extracted information. While this finding may not seem very striking for itself, its full value may be appreciated when comparing the findings of the different levels of task complexity. Finally, the color scheme of different information types indicates that information sources that provide factual information and task information are more relevant for solving case-based decision tasks than those that offer social information.

As mentioned earlier, the comparison of such observations with tasks of higher levels of complexity reveals the full explanatory power of the context-specific analysis of information source usage of young professionals in management consulting. Hence, the results for the sample group of common work tasks with the complexity of investigative decision tasks are presented in figure 45.[55] As observed in table 12, this task category represents the most common level of task complexity in the daily work environment of young professionals in management consulting. Accordingly, the results of information source usage for information seeking activities involved in solving investigative decision tasks were given particular attention. The phases of information seeking involved in solving such tasks, where the type and structure of the result may *a priori* be anticipated, but permanent procedures for performing the task have not yet emerged and where the process itself is largely unforeseeable, have been identified in section 1.1 to be the following:

- understand problem & identify information need
- gather overview of existing information sources
- conduct search & gather information
- extract information & evaluate quality
- consolidate & adapt information
- evaluate relevance
- finalize & present.

Apart from the differences in the involved information seeking activities and the higher degree of recursivity, figure 45 immediately points to the fact that the amount of information sources involved in solving this task of higher

55 The detailed results of *Q9* for investigative decision tasks and unstructured exploration tasks may be found in appendix C.

complexity than the former is comparably larger. This may be confirmed by the observation that those analysts and consultants that perceive their common work tasks to be investigative decision tasks, reported to consult an average of 19.38 (SD = 9.29) sources when seeking information. More importantly, however, the usage of sources differs across the phases of information seeking.

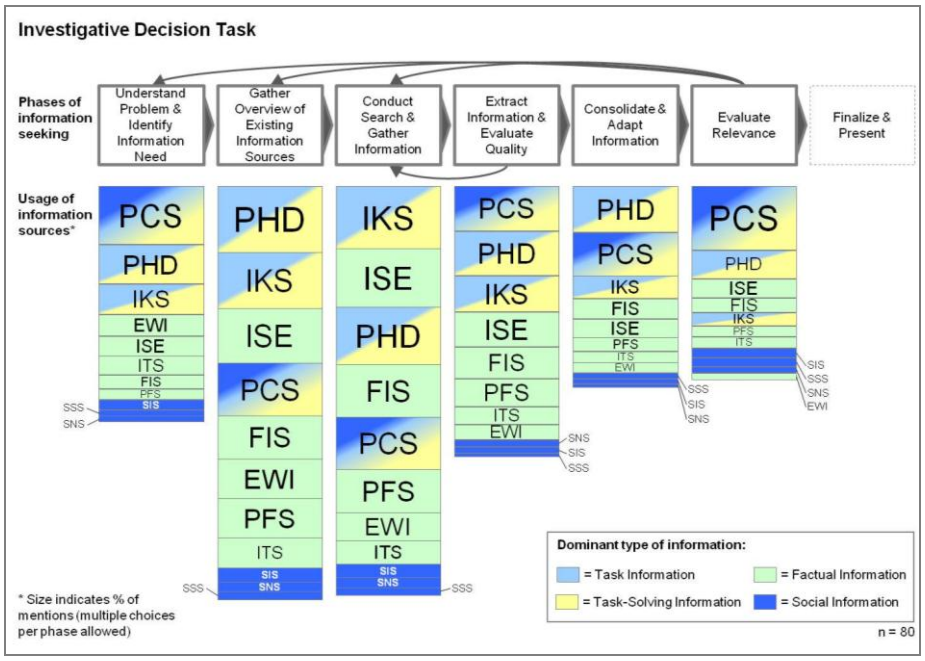


Figure 45
Context-specific source usage for information seeking of investigative decision tasks

In contrast to the high degree of internet search engine usage when conducting a search and gathering information for case-based decision tasks, intranet knowledge sources play a more important role for the more complex type of IDTs. Furthermore, personal contacts, such as the project supervisor, client or peer colleagues, are among the most used sources of information throughout the entire process of information seeking. This, as well as the importance of information gathered from the personal hard drive or team's network drive, also indicates that analysts and consultants depend on social and task-solving information much more when being confronted with work tasks of a higher degree of uncertainty and complexity. Information sources that are characterized to dominantly provide factual information, such as internet

search engines, factual internet sites and printed factual sources, are used by young professionals in the phases 'gather overview of existing information sources', 'conduct search & gather information' and 'extract information & evaluate quality'. They are, however, not as frequently used as the before mentioned information sources.[56] Even though the responses of the sample for investigative decision tasks express an increased relevance of social information, those emerging social software applications – internal as well as external – that are most commonly perceived to provide this type of information were hardly mentioned to be used by the participants of the study. Section 6.4.3 will further investigate this observation in detail and analyze the familiarity with social software in private as well as professional contexts.

Completing the presentation of results regarding the context-specific source usage for the information seeking activities of young professionals in management consulting, the behavior in confrontation with unstructured exploration tasks is visualized in figure 46.

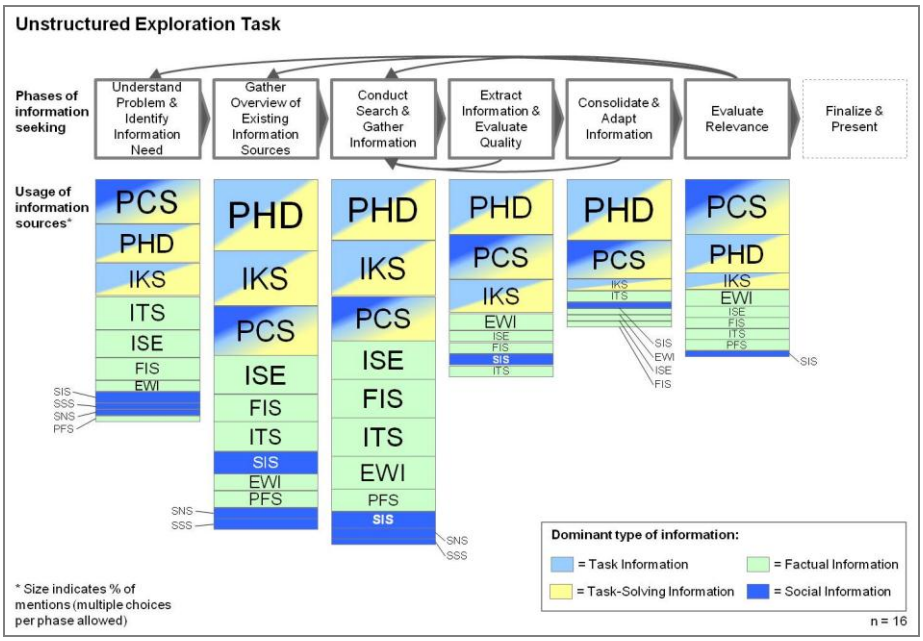


Figure 46 Context-specific source usage for information seeking of unstructured exploration tasks

56 A detailed overview of the exact figures in terms of % of respondents is presented in appendix C.

As defined in section 5.3.2, this task type represents the lowest degree of *a priori* determinability. Thus, neither the type and structure of the process as well as its result nor the information requirements can be anticipated in advance. Therefore, activities aiming at structuring the problem have highest priority, which may result in the processing of any of the before mentioned task types. When being confronted with this type of task, young professionals in management consulting engage in all of the for investigative decision tasks mentioned activities of information seeking. The sequence of the identified phases, however, is less linear, since the high degree of complexity requires to review previous work steps and refine the search or even adapt the original understanding of the problem and identified information need. Those participants that indicated to perceive their work tasks to be best represented by the category of unstructured exploration tasks, reported to consult an average of 16.56 (SD = 10.79) sources when seeking information. Yet as the visualization of results above reveals, some sources of information stand out of this selection. Particularly the personal hard drive or team's network drive and personal contacts are consulted during those activities involved in gathering an overview of available sources, actively conducting a search and gathering information as well as extracting the relevant information and consolidating it in order to satisfy the identified information need. In few instances, also the available intranet knowledge sources are used, as for example when gathering an overview of existing sources of information or conducting a search and gathering information. As assumed in the derivation of the context-specific model of task-based information seeking (see section 1.1) and described in the definition of the task type of unstructured exploration tasks, however, most information indeed seems to lie in the immediate environment of the task. Therefore, general-purpose information sources such as internet search engines, factual information sources, printed factual sources, external wikis, social intranet sources, social networking sources and social sharing sites play a very little role for this type of task in the information seeking behavior of young professionals.

This concludes the presentation of the results of the context-specific survey of information source usage as a function of task complexity and phases of information seeking. Before this data is discussed from a normative perspective (see section 1.1), the use of social software as a source of information and the overall satisfaction of the participants with the existing information environment in their workplace in management consulting shall be further illuminated in the next section.

6.4.3 Private and professional use of social software as an information source

The hitherto presented results have revealed that the use of social software applications as sources of information by young professionals in the workplace in general (see table 13) as well as a support of task-based information seeking activities in specific (see section 6.4.2) is much lower than that of rather traditional sources of information. The exact role of this type of information source, however, cannot be determined based on the data gathered so far. As part of item I.7 of the online questionnaire on information seeking behavior of analysts and consultants at *Accenture Management Consulting* the usage of social software applications was therefore surveyed in further detail. In this section the usage behavior was further differentiated between internal and external social software applications as well as between the use for private and professional purposes. First of all, participants were asked to rate how often they visited any of the below mentioned internal information sources for professional purposes in general. According to the classification of social software defined in section 2.1.1, these were categorized in internal social networking sites, internal social sharing sites, internal wikis and internal blogs. The results (displayed in figure 47) draw a more precise picture of social software usage.

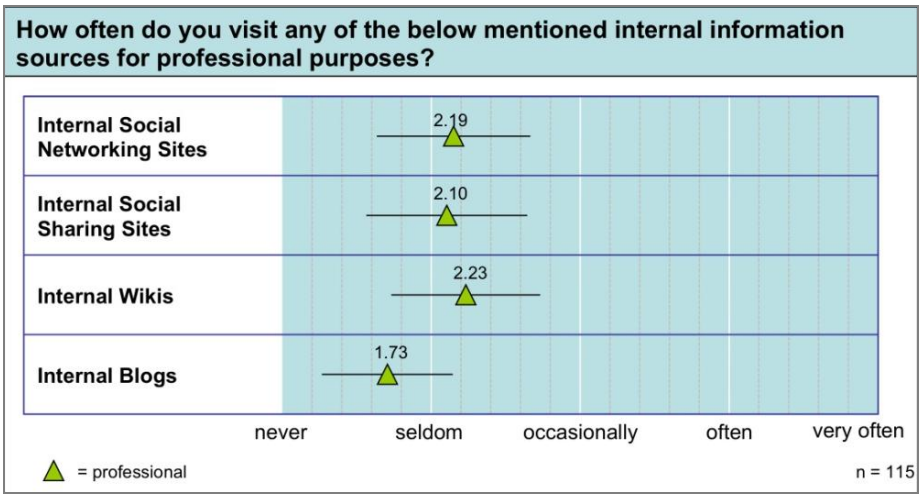


Figure 47 Use of internal social software for professional purposes

Internal blogs prove to be used least for least by the participants for professional purposes (M = 1.73 / SD = .88). Still, every fifth respondent indicated to use this type of social information source occasionally or more frequently in a professional context. The variety of internal social sharing sites, such as the *Accenture Media Exchange* and *Group Sites* for sharing bookmarks and status messages presented in section 5.3.5, are used by every third participant occasionally or more frequently for professional purposes (M = 2.10 / SD = 1.08). Furthermore, 35% of the sample group reported to be using the internal *People Pages* occasionally or more often in a work situation (M = 2.19 / SD = 1.03). Ultimately, internal wikis such as the *Accenture Encyclopedia* or other project-based wikis are used by 43% of analysts and consultants in *Accenture Management Consulting* on a regular basis (M = 2.23 / SD = 1.00).

As it was one of the central points of departure of this thesis that young professionals are often expected to show a strong familiarity with social software applications based on their leisure-based media usage (see section 1.1), the participants were asked to rate their usage of the following categories of information sources in a private context:

- external social networking sites,
- external social sharing sites,
- external wikis, and
- external blogs.

Since it may be assumed that internal information sources only serve a professional purpose, the answer categories were limited to publicly available websites that may as well contain recreational and entertaining content. Accordingly, they were explained[57] to refer to social web services, such as *Facebook*, *Delicious*, *Wikipedia* and *Blogger*. Figure 48 presents the results of this question and confronts them with the previous data of the usage of external sources for professional purposes.

57 This was realized by a mouse-over pop-up display of examples in order to clarify each answer category.

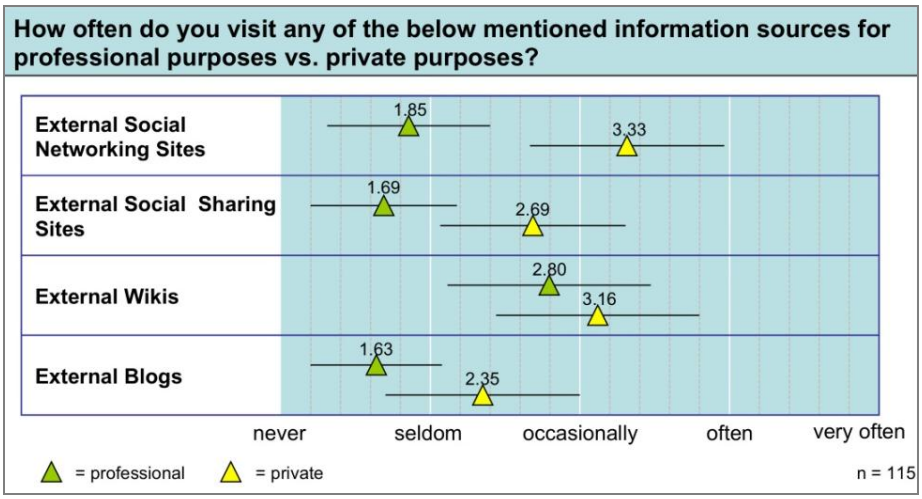


Figure 48 Use of external social software for professional vs. private purposes

The presentation of mean values[58] above reveals that the way young professionals in management consulting use social software applications varies depending on its purpose. All of the gathered values indicate a higher frequency of use when having a non-work-related question, e.g., for entertainment or other private interest, compared to work-related questions. While 41% of the respondents use external blogs (M = 2.35 / SD = 1.30) occasionally or more often for private purposes, only 15% of the participants consider them in the context of work (M = 1.63 / SD = .86). This also applies to the use of public social sharing sites. Here 30% of the respondents said to be using these applications for private matters (M = 2.69 / SD = 1.24) compared to 13% for professional purposes (M = 1.69 / SD = .97). In regards to the use of wikis, this difference in the intention of use does not differ as much. For both contexts, external wikis are visited regularly for private (M = 3.16 / SD = 1.36) as well as professional (M = 2.80 / SD = 1.36) purposes. The largest difference in the usage behavior of social web applications, however, may be assessed in regards to social networking services. While this type of application proves to be an essential part of the recreational information seeking behavior (M = 3.33 / SD = 1.30), 77% of the analysts and consultants respon-

58 For methodical considerations regarding the statistical analysis of these values, see the previous footnotes of this chapter about assumptions about the distribution of this scale.

ded that they never or seldom used public online social networks for professional purposes (M = 1.85 / SD = 1.09).

These results show that the high familiarity with and usage of social web services so far has not been transferred from a recreational to a professional level. Possible reasons for this will be further discussed in chapter 7 together with a normative evaluation of the role (internal as well as external) social software applications might play in the information environment of young professionals.

6.4.4 Satisfaction with existing information environment

The results of the survey of information seeking in management consulting shall be completed by taking a look at the respondents' satisfaction with the existing information environment at *Accenture Management Consulting*. In order to analyze whether the participating analysts and consultants are satisfied with the quality, accessibility and variety of the overall information environment at their workplace, three questions were asked.

First of all, the participants were asked to indicate how well[59] the overall information environment at the workplace supported them in their information seeking activities. According to the questionnaire logic (see figure 38) the participants were only confronted with those phases of the task-solving process that were identified in the context-specific model of task-based information seeking to be relevant for the task type that best represents the complexity of their daily work in management consulting. This allowed for a context-specific evaluation of the satisfaction of analysts and consultants with all of the before mentioned sources of information and refers to all internal and external sources as well as to non-digital sources, such as printed material or personal contacts. Altogether, the participants indicated to be quite satisfied with the overall information environment, as the visualization of mean values of the respective task type and information seeking activity in figure 49 reveals. Across all activities and task types, the overall mean value of 3.11 (SD = .97) shows that the satisfaction with the information environment in general is perceived as 'good'. Going further into detail, however, it is revealed that this value differs slightly depending on the level of task com-

59 The 5-point Likert scale was scored from 1 ('poor') to 5 ('excellent'). The values displayed in figure 49 represent the mean values across all participants of the study and presume the scale to provide even intervals.

plexity and different information seeking activities. Hence, those analysts and consultants that are most commonly confronted with investigative decision tasks (IDT) are less satisfied with their overall information environment compared to those that perceive their common work tasks to be less complex (CBDT). This is particularly the case in the phase where individuals conduct a search and collect information (CBDT: M = 3.31 / SD = 1.14; IDT: M = 3.01 / SD = 1.05). Still, the overall level of satisfaction with the information environment in the different phases of information seeking does not vary significantly between IDT und CBDT.

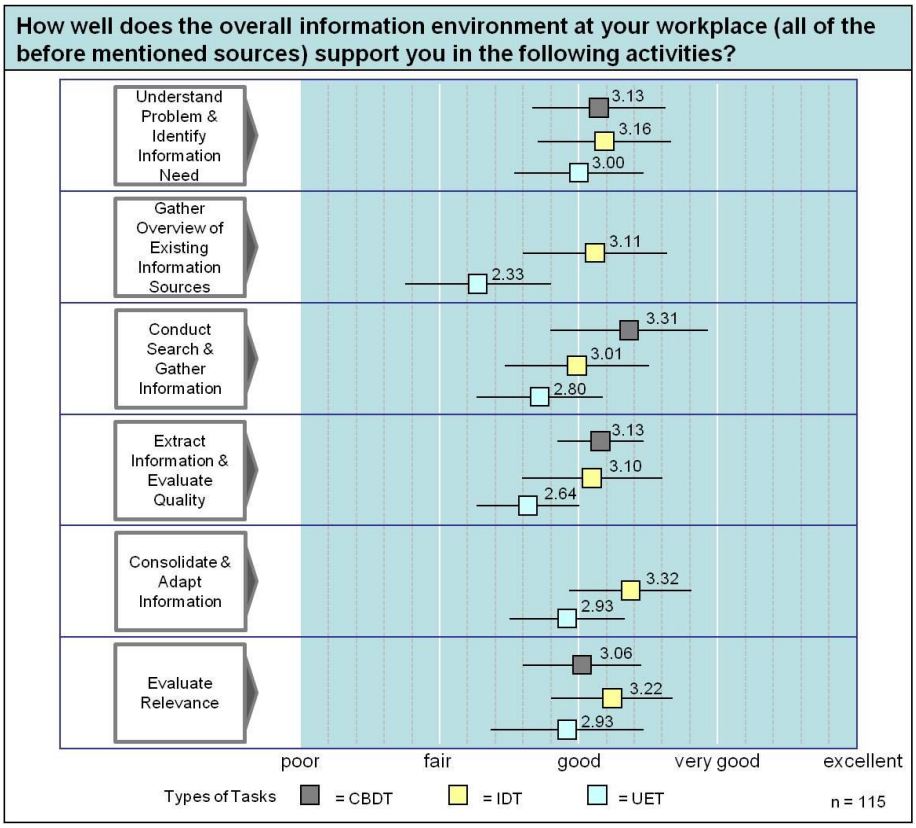


Figure 49
Context-specific satisfaction of respondents with information environment

It may be observed, however, that participants who perceive their daily work tasks to be rather unstructured and highly complex (UET) are generally less satisfied with the information environment (M = 2.77 / SD = .93) and specifically do not seem to receive sufficient support when gathering an

overview of existing information sources (M = 2.33 / SD = 1.05), conducting a search and collecting information (M = 2.80 / SD = .94), or extracting information and evaluating its quality (M = 2.64 / SD = .74).

Second of all, the satisfaction with the electronic information environment in general was surveyed. This referred to all of the sources of information that are provided by the employer in particular. External sources were not considered, since this would have represented a fuzzy category without direct indication for the interest of this study. Accordingly, participants were asked how well the electronic information environment (such as *Accenture Portal*, *People Pages*, *Knowledge Exchange*, *SharePoint* and *MyLearning*) supported them in order to complete their daily work tasks in general. The mean value across all respondents (n = 115) describes a rather fair to good level of satisfaction (M = 2.77 / SD = .94) with the current electronic information environment at *Accenture Management Consulting* (see figure 50).

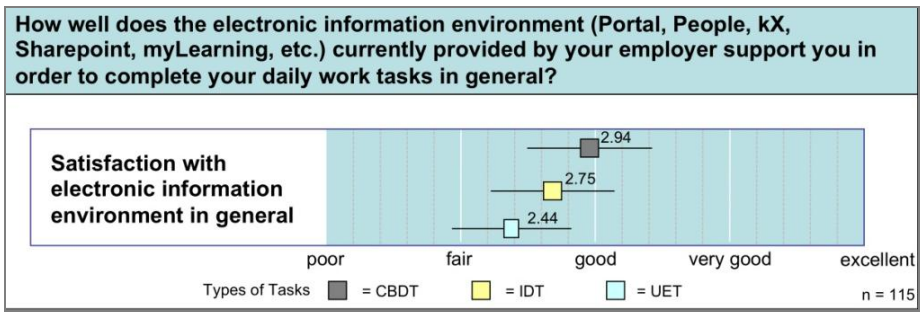


Figure 50
Context-specific satisfaction of respondents with electronic information environment

Taking into consideration the different levels of task complexity, however, the above described trend is further extended. Only 56% of the respondents who perceive their common work tasks to be unstructured exploration tasks (M = 2.44 / SD = .89) describe their satisfaction with the electronic information environment as good or very good. This is a much lower value than that for tasks of lower complexity (CBDT: M = 2.94 / SD = .93), where 75% of the participants expressed their satisfaction with the electronic information environment to be good or better. Thus, the satisfaction with the electronic information environment decreases with rising task complexity.

As final element of the item regarding the satisfaction of young professionals in management consulting with their information environment (*I.6*) the survey asked the participants what aspects of the electronic information

environment they would like to see improved in order to better support them in their information seeking activities in the workplace. This open-ended question resulted in a variety of qualitative comments from the participants. These replies were clustered and aggregated in table 15:

Table 15: Qualitative critique and suggestions of improvement for existing electronic information environment

What are general aspects of the electronic information environment you would like to see improved in order to better support you in such activities as mentioned above?[60]
General
"There needs to be one single point for 1st contact from where I can access all sources directly. Too many links/SharePoints not being linked or being locally on hard drives ... The securest to get the best overview on what is available is still personal network, although KX has improved."
"The Knowledge Exchange is hard to navigate and usually not of value. I've found that it's best to just Google search for the information."
"I turn to my personal contacts to get structure or industry research rather than go there. The KX is the last place I ever look for any kind of information."
"The current information sources I have had to heavily rely on are incomplete, therefore limiting my data-gathering and synthesis needs."
"Improve portal search to group relevant items. Consolidate where I need to go for information. Right now there are too many sites to remember."
"Especially the KX needs to be improved."
"Well-arranged knowledge platform. Like a 'KX in new' that can be and actually does get used as an expert network. It would be better to have ONE comprehensive platform than many different point of contact."
"On our project knowledge is hardly externalized. Most information is on hard drives and only accessible via personal contacts."
"The existing implicit and explicit knowledge and documents should rather be stored centrally and sorted appropriately instead of being scattered over different colleagues, SharePoints, KX, etc."
Search & Access
"The KX is very difficult to search and feels like it doesn't contain or makes it very hard to find information that should be easily available."
"[…] I can tell you that KX (and the Accenture Portal in general) desperately needs a new search feature. The current search program used in KX and the portal is frustrating and almost useless." →

60 The replies from German participants of the study were translated and might therefore differ slightly from their original connotation.

"KX has terrible search functionality and it is nearly impossible to get any relevant information in a timely manner."
"I'd like to see a better search capacity on the portal. There seems to be a lot of information out there but it is challenging to find relevant information."
"Better search capability."
"It is very hard to find relevant information on the KX. I find the search engine is poor and often provides results that are unrelated to the topic I'm searching for. It would be great if we could select the type of material we want the KX search to display. For example, case study, end user training material, articles, journals etc. ..."
"Finally a good search functionality in KX."
"Very difficult to find anything in KX. There is so much on there that it takes a lot of time to search to find exactly what you are looking for."
"Indication of relevance of search results, accuracy, actuality of provided information (some information is really old), standardization of classification criteria for upload of information (e.g., keywords, required information)."
"Search Engine – KX content and keywords not specific enough."
"The search engine needs to be quicker and more efficient. Keyword search should return more targeted information."
"Search functionality in KX."
"Especially in KX an improved, topic-specific search mask and clear result lists."
"The internal search on the available resources is insufficient."
"Better access to industry / analyst reports for a better understanding of clients and industries."
Quality & Content
"Improve quality of the Knowledge Exchange! It is very difficult to locate material of value in all of the 'clutter'."
"Host a section of the Knowledge Exchange (or similar site) with information specific to Management Consulting engagements."
"We need better resources for research in projects for things such as market sizing, competitive analysis, etc."
"How to approach a new task / how to get started / how to structure presentations (high-level). Breaking down categories and giving an outline of how to approach and work through the problem in order to create structured presentations that are according to the structure that my manager requires."
"Catalogue that is categorized by both 'industry' and 'function'"
"The KX is good but there is just too much junk sometimes and the search results can be pitiful."
"KX needs a regular cleanup."
"Totally new structure + quality assurance of input."
"Most of the information is not helpful and out of date, especially on the KX."
"KX and the Accenture Portal could be tagged more clearly." →

Technical
"Search function of many internal databases is often down, improve its uptime."
"KX tends to be difficult to navigate and rarely returns good results immediately."
"Improve structure and performance of KX."
Training
"Some trainings could be more relevant to my actual work tasks. Sometimes there is a mismatch of information needed and training sessions available (meaning I do need the information earlier as I am able to sign up for and get a training session)"
"MyLearning products should provide summary of content"
"Handout for later usage would be helpful"
Collaboration
"It should be mandatory to fill in fields in People Portal."
"I believe that the different offerings in MC need to do a better job of consolidating their information / credentials / contacts etc per offering."
"All projects should be obliged to upload their deliverables to KX so that one does not only find deliverables but also the corresponding network of colleagues that currently work in similar roles."

The above presented feedback provides a more detailed impression of critique and suggestions for improvement that were made by the analysts and consultants in management consulting: While the overall satisfaction level with the electronic information environment (see figure 50) did not necessarily give the impression that there is a strong demand for improvement, the qualitative remarks clearly express a certain frustration with the electronic information sources that *Accenture* provides to its analysts and consultants in management consulting. Three categories of critique stand out: first of all, general remarks regarding the electronic information environment, secondly, critical comments regarding the search and accessibility and thirdly, the quality and content of information sources.

Most strikingly, the *Knowledge Exchange*, an internal database for the documentation and exchange of credentials, proposals, offerings, engagement profiles, business processes, is criticized in many ways. This source of information – as part of the category intranet knowledge sources – is a central reference point for young professionals in the electronic information environment at *Accenture*. One of the main levers for improvement seems to be the search functionality. According to further remarks, however, a lack of adequate documentation as well as quality evaluation is criticized. The observation that relevant information oftentimes is not externalized but may only be retrieved from subject matter experts or one's own hard drive, pro-

vides first explanations for the above described finding of a dominance of personal contact sources and personal hard drives as primary sources in the information seeking behavior of young professionals in management consulting. Apart from that, there are voices that criticize the information environment in general and call for one single point of contact to start the information seeking process with. For some, external sources such as *Google* already seem to have taken over this role.

These final survey results regarding the satisfaction of the participants with the existing electronic information environment represent the last piece in the mosaic of the context-specific use of information sources in the workplace of young professionals. They provide plausible explanations for the previous observations and shall guide the final discussion of the role of social software as possible source of information in the workplace environment and the derivation of recommendations regarding the design of the electronic information environment in management consulting.

6.5 Summary

The presented results of the context-specific survey on information source usage provide extensive insights into the work environment and common types of tasks in management consulting, the information needs of young professionals in the workplace and their usage behavior of information sources when being confronted with new work tasks. In support of *WH1* it may be summarized that the examined workplace environment in management consulting is characterized by highly complex work tasks, which are best described as investigative decision tasks. Young professionals mainly encounter such situations of uncertainty when being engaged in client-related project work at the client site. These types of tasks are rather given to them by others than self-initiated and mostly processed with their laptop.

In order to seek the information required for solving their work tasks, young professionals use a large variety of information sources ranging from personal contacts and their own hard drive to intranet knowledge sources, internet search engines, external wikis, instructed training sources and printed factual sources. This clearly supports *WH2*. There is, however, a clear gradient in regards to the usage of the different sources, as young profession-

als predominantly turn to their personal contacts as a source of information and search their personal hard drive, the internet, or internal knowledge sources.

Apart from the overall frequency of use of information sources, a context-specific understanding has been achieved, explaining for which types of tasks, activities of information seeking and types of information these sources are used. Figures 44 through 46 visualize these findings and enable a well-founded analysis of the role of each of the identified sources in the information environment as a function of task complexity and information seeking activity. The results show that the amount of used information sources for investigative decision tasks and unstructured exploration tasks is highest in those phases where young professionals aim at gathering an overview and collecting first information. In regards to the different activities of information seeking, it was shown that personal contacts play an important role for supporting young professionals in understanding their common daily work tasks and identifying their information need, extracting information from the gathered objects and evaluating the quality and relevance if the information for the task at hand. The personal hard drive, intranet knowledge sources and internet search engines are predominantly used when gathering an overview of existing sources of information and conducting a search and collecting information.

In regards to the influence of task complexity on the choice of information sources, it was shown that individuals that are faced with tasks of lower complexity (CBDT) generally turn more often to their personal hard drive, while participants that are most commonly confronted with more complex tasks (UET) rather turn to personal contacts for relevant information.

This also indicates that the type of sought information varies depending on the complexity of a task (slightly supporting *WH3*). It was, however, not possible to identify a specific relevance of these types of information for highly complex tasks (opposing *WH3*). The survey rather revealed that young professionals seek for all information types when being confronted with their common daily work tasks (IDT), slightly varying in frequency with factual information being the most important type of information, then task information, social information and task-solving information.

In general, the participants of this study reported to be quite satisfied with the electronic information environment provided by their employer. A closer look at the results, however, revealed that the satisfaction with the overall information environment decreases with rising task complexity and is par-

ticularly low in phases where individuals aim to gather an overview of existing sources of information, conduct a search and collect information or extract information and evaluate its quality. The qualitative remarks of the participating young professionals furthermore disclosed a certain degree of frustration with the electronic information environment in general and the search and accessibility as well as quality and content of information sources in particular.

Finally, the current role of social software applications in the task-based information seeking behavior of young professionals in management consulting may be summarized as follows: Even though analysts and consultants are quite familiar with social web applications, which they use regularly as sources of information for non-work related questions, job entrants in management consulting neither consult internal nor external social software applications very regularly for professional purposes (with the exception of external wikis). This clearly disproves the assumption of *WH4* and requires further investigation. The frequent use of social networking services and external wikis as well as social sharing sites for private purposes, however, identifies a gap between private and professional usage of social software applications and points at an unleveraged potential of transferring habitual usage patterns from recreational to workplace contexts.

In the following, the here presented observations and identified gaps will be discussed together with the considerations of the previous chapters from a leadership perspective in order to derive measures for leveraging the potential of social software as a source of information in the workplace in a specific context of use.

7 Social software as a source of information in the workplace

This chapter summarizes the potential of social software as a source of information in the workplace of management consulting and presents the results of discussing it in the course of a leadership workshop with regards to the actual information seeking and source usage behavior of young professionals. Thus, the hitherto descriptive results are assessed from a leadership perspective, reflecting context-specific challenges and management interests. As a result, measures for leveraging the use of social software as information source are derived within a specific area of tension of conflicting interests.

Section 7.1 introduces the goals and approach of the ultimate step of this study. It furthermore outlines the structure and content of the leadership workshop by giving an overview of the participants and their respective perspective on the subject matter. Section 1.1 then summarizes the previous considerations regarding the role of social software as an information source in the workplace in general and presents considerations from a leadership perspective with respect to the potential to support young professionals in building awareness and solving tasks in the specific context of management consulting. The benefits associated with social software in the corporate information environment are confronted with the actual usage behavior of young professionals and discussed in section 1.1. This leads to the identification of context-specific challenges and reflection of leadership interests. As a result, exemplary measures for leveraging the use of social software in the specific workplace environment of the empirical are presented in section 1.1. Finally, the main conclusions of this chapter are summarized in section 1.1.

7.1 Introduction

As final step of this study, a leadership workshop with representatives from senior executives and senior project managers of *Accenture Management Consulting* was conducted together with two academic researchers of information retrieval and human computer interaction (see figure 51).

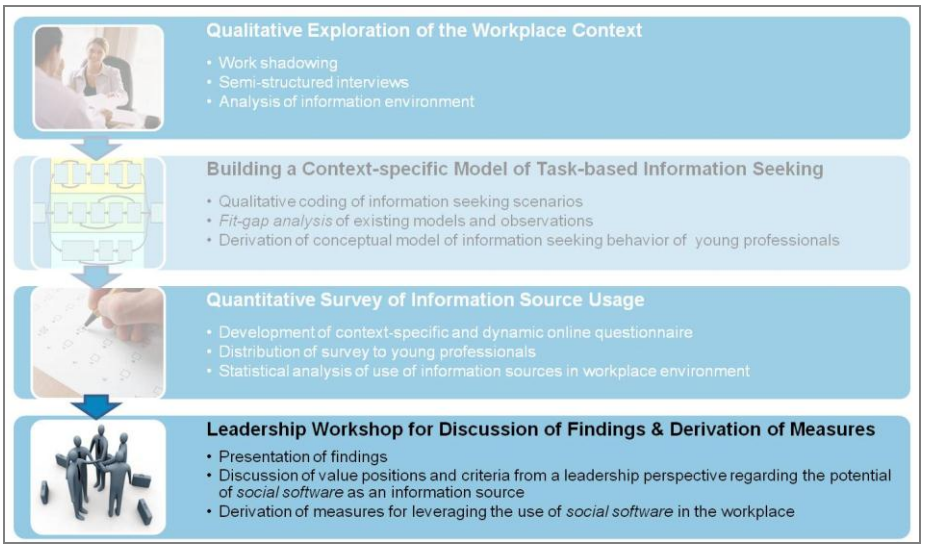


Figure 51 Leadership workshop: discussion of findings & derivation of measures

It was the goal of this workshop to present the above described findings regarding the task-based information seeking behavior of young professionals in management consulting in order to discuss the results with respect to the corporation's overall goals as well as organizational challenges and restrictions. This applies not only to the identified process of information seeking (see section 1.1) but most importantly to the surveyed usage of social software applications for private and professional purposes (see section 6.4.3). These findings were confronted with the identified potential of social software (see section 1.1) and social intranet sites (see section 5.3.5) in the light of the interests of the corporate leadership in order to derive measures for leveraging the use of social software as source of information in the workplace environment of young professionals in management consulting. Hence, the structure of the leadership workshop may be summarized as follows:

- *Present* results on information seeking behavior of analysts and consultants in *AMC*
- *Discuss* the potential of social software as an information source in the workplace
- *Identify* leadership interests and limitations that challenge the realization of the identified potential in the specific organizational context

- *Derive* quick win and long-term measures for leveraging the use of social software as a source of information in the workplace

Two senior executives and one senior project manager from the *Management Consulting* operating group of *Accenture* in Austria, Switzerland and Germany participated in this leadership workshop. The senior manager was the lead of a program office of an ongoing post merger integration project in the banking industry with prior experience in financial services (industry) as well as collaboration and knowledge management projects (functional). As a project manager, she represented the role of a project supervisor for analysts and consultants in their daily management consulting work. One of the participating senior executives was part of the global leadership team of the *learning design & delivery* offering within *AMC* and in charge of a consulting as well as service workforce with a specialization in training development and delivery. In his daily routine he works with representatives from the sample of this study in his role as internal supervisor as well as in selected projects as overall program lead. The other senior executive was responsible for the consulting workforce's activities in the telecommunications and high-tech industry in the German-speaking region. In this role his perspective on young professionals in management consulting is rather of an internal nature with a focus on their skills, abilities and value for the clients' needs as well as for the business performance of the firm. Hence, this selected circle of participants represented different leadership perspectives from the daily management of a consulting project across leading a workforce with deep functional expertise towards the business development of consulting activities in an entire industry.

Together with the external perspective of two experts from the field of information science, the workshop was moderated in order to discuss the findings of this study and theoretical considerations regarding the potential of social software as a source of information in the workplace. Therefore, the findings were presented in various steps with subsequent discussion rounds to identify leadership interests, expectations as well as personal experience and match them against the gathered observations and survey results. Based upon the gathered appraisals, ideas for measures in order to improve the electronic workplace information environment by the means of social software applications were collected and clustered according to their time horizon or feasibility. In order to document the different expert positions, criteria and ideas flipcharts, meeting minutes and audio recordings were used. The fol-

lowing sections present these results in an aggregated form and describe the main findings.

7.2 The potential of social software as a source of information in the workplace

As a basis for the leadership workshop, the potential of social software to serve as a source of information in the workplace in general was summarized as follows:

Social software applications such as online social networks, wikis, blogs, or social sharing sites support users in exchanging information, building and nurturing relationships and communicating and collaborating in a social or collective context. As such, they primarily serve as platforms for user-generated content, while a majority of the user population consumes the exchanged, aggregated, or collaboratively created information passively and only a small portion of users contributes actively. Apart from using social software for leisure-based activities and entertainment, it increasingly represents a central gateway for seeking information and content discovery. The information provided by and created with these types of applications originates outside professional routines and is based upon bottom-up concepts of knowledge exchange. Any user may produce, correct, share, rate, or recommend content to others, which characterizes the provided information to be of a social nature.

As such, social software promises to serve as valuable source of information in the professional work context. In regards to the specific requirements of corporate organizations, however, the concept of social intranet sites become increasingly important. Such sites may be implemented in order to transfer popular phenomena of the social web into corporate boundaries. Therein, social networking sites have the potential to support nurturing and building a personal network in order to have access to a wider group of personal contact sources and potential subject matter experts. Blogs, microblogs and status messages enable lowering the threshold for finding shared experiences or reproduce previously asked questions in a digital and retrievable format. Wikis may be used for accessing pre-selected factual information and collaboratively gathered experiences and knowledge. Finally, internal social

sharing sites offer the access to information objects that are recommended or even created by colleagues in a look-and-feel known from popular social web services outside the professional context.

This analytically derived prospective value-add of social software in the workplace information environment, however, needed to be discussed from a leadership perspective in order to reflect management interests and account for context-specific restrictions and challenges in management consulting. As a result of the leadership workshop, the following potential of social web services and social intranet sites as sources of information was identified for young professionals in the context of this study.

7.2.1 Social web services as sources of information in management consulting

In their analysis of the potential of social web sites such as social sharing, social networking sites and external wikis to serve as sources of information for young professionals within their organization, all participating representatives of the senior leadership of *Accenture Management Consulting* shared certain hopes as well as reservations. Altogether, these may be explained by the direction of information flow between the organization and these external applications and their overall controllability.

When it comes to the absorption of external information, senior executives and senior manager consider social web services such as *Facebook*, *LinkedIn*, *Xing*, or *Slideshare* to have the potential of providing valuable information about clients, relationships, experiences and other business-related contextual clues. Especially in the case of *Wikipedia*, this is deemed to be an example of publicly available user-generated content that might provide certain information to employees in management consulting they would not be able to retrieve from strictly internal information sources. This means that passively consuming information from such sites is regarded as offering a potential value-add to the electronic information environment of young professionals.

The active use of such applications, however, confronts senior leadership with a dilemma. While public social networking sites are considered to be quite valuable tools for nurturing existing relationships with clients and supporting the access to social information (e.g., recommendations, ratings, experiences) from contacts outside of the firm, they are at the same time seen as

a potential threat to corporate confidentiality and compliance concerns in case employees contribute content actively. Even though clear guidelines regarding a code of conduct and possible non-disclosure agreements with clients have been communicated to all employees (and new joiners in particular), the social web is considered to endanger characteristic elements of the management consulting industry. The participants of the workshop expressed their preoccupation that new joiners might not always manage to distinguish between private and strictly professional, i.e., confidential exchange of information. Furthermore, allowing employees to visit such web sites during office hours would make it difficult to control work performance and discipline.

7.2.2 Social intranet sites as sources of information in management consulting

Thus, along the lines of the argumentation of section 2.3.2, senior executives and project manager expressed their appreciation of the internal '*Collaboration 2.0*' initiative and the introduction of social intranet sites in recent years. These sites are expected to have the potential to be established as sources of information for:

- **extending personal networks** and facilitating 'diving into the *Accenture Management Consulting* world' (e.g., by discovering and nurturing social relationships in an internal social networking service),
- **building awareness** of activities, knowledge and experts within the firm (e.g., by distributing regular digests of newly generated contents and activities on all social intranet sites),
- **sustainably visualizing information** and communication, so that it might serve as source of information for future requests (e.g., by documenting frequently asked questions in an internal wiki or 'how to'-podcast series on a social sharing site),
- **sharpening an expert's profile** and supporting the development and rise of new experts by offering various ways of expressing and contributing expertise (e.g., by displaying project experience, authored reports or presentations and topic-related activities within the organization on a personal profile page),
- **contextualizing information** of intranet knowledge sources so as to provide the different users and roles with respective views on informa-

tion (e.g., automatically extracting information about the client context, personal background and opinions of a certain document from artifacts generated through the active participation on social intranet sites).

Based on the assumption of an increasing amount of user-generated content, the high demand for social information in management consulting is expected to be satisfied by combining traditional intranet knowledge sources with social intranet sites. Thus, such content as status messages, blog posts, ratings, recommendations and personal networks may be utilized in order to extend information on the *Knowledge Exchange* by adding meta-information, i.e., dynamic context to originally static information objects (e.g., presentations, text documents and calculation tables). There are some first approaches that are currently introducing this idea into the existing information environment (see figure 52) but need to be extended in order to reach the level of sophistication envisioned above.

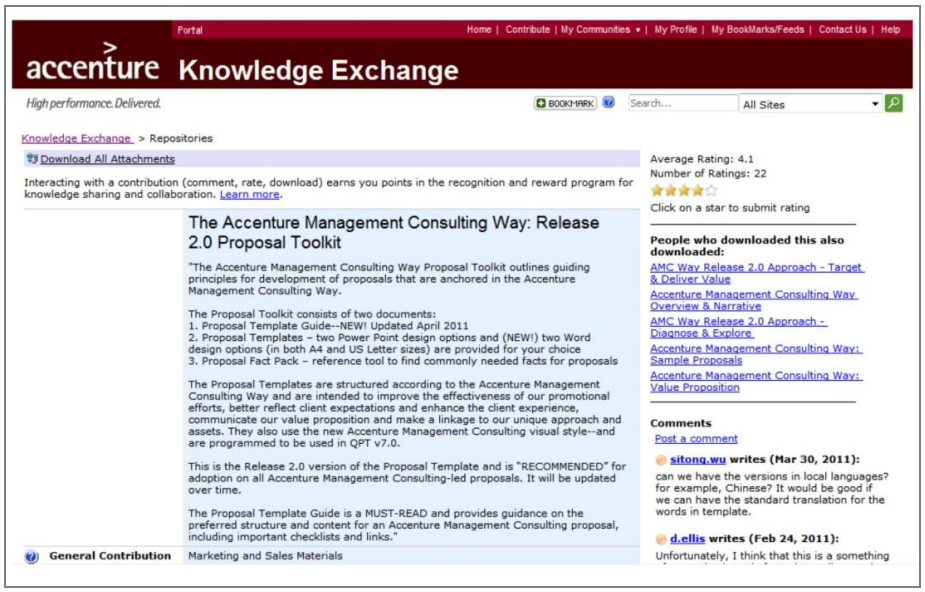


Figure 52 First approaches to converging social information and traditional intranet knowledge sources

The screenshot of the *Knowledge Exchange* reveals how a classic knowledge management tool (as collection of documents) may be extended by including social information such as user ratings, comments and recommendations of other related documents in the right-hand column. This mixture of system-generated ('people who downloaded this also downloaded') and user-

created social information (star ratings and comments) may be considered a first step into the discussed potential of 'contextualizing information'. Most social information, however, still coexists either in separate applications or tabs and does not converge with more traditional information objects of factual information or task information.

Furthermore, the different opportunities offered by social intranet sites for asking questions (e.g., in discussion forums or via status messages) are considered to provide access to a wider audience and increase the chances of retrieving social information from subject matter experts across the entire firm regardless of organizational and geographical alignments. Hence, these types of applications are primarily seen as digital channels to personal contact sources. As the benefits discussed above reveal, however, the traceability of visible information and communication processes as well as the availability of the documented results have the potential to turn these applications into searchable sources of information.

Finally, it was pointed out that the manifold benefits of social intranet sites as sources of information in management consulting could only be realized if there was a critical mass of employees that frequently contributed content and if the resulting data was maintained and structured well enough.

7.2.3 Context-specific support of young professionals' information seeking behavior

Asked about context-specific use cases of social software for the different activities of information seeking along the process of solving investigative decision tasks, the participants of the workshop remarked that the potential use of social intranet, social networking and social sharing sites as sources of information may generally be considered in regards to building awareness outside of the process of active information seeking. These services are mainly considered to support young professionals in staying up-to-date about current developments, activities, experts and available information. This type of 'push information' (as for example provided by daily e-mail digests of online activities of users in one's personal network) represents a recognition value, which is realized when young professionals are confronted with a new task and remember 'I have seen that somewhere before'. This may be associated with such concepts as 'monitoring' (Ellis 1989) or 'passive attention' (Wilson 1997), since it is not initiated actively and therefore not directed.

Apart from this informative function, further potential benefits of social software as a source of information in the workplace could be identified on the level of task-based information seeking.

First of all, it was stated that external wikis such as *Wikipedia* have become part of every-day life information seeking and may be expected to serve as established sources of information in the professional context of remarkable quality (cf. Hammwöhner 2007; Hammwöhner et al. 2007). In regards to the activities involved in solving common work tasks in management consulting, they are considered relevant for supporting young professionals in understanding the problem and identifying information needs and gathering an overview of existing information sources by providing orientation as well as identifying relevant concepts and their definitions. Furthermore, social intranet sites such as *People Pages* or *Groups Sites* that include the use of status messages (also called 'conversations'), discussion forums, blogs, ratings or comments may serve as a way of digitalizing and visualizing common information needs and relevant subject matter experts in the phases of gathering an overview of existing information sources, conducting a search and collecting information, extracting information and evaluating quality and evaluating relevance of the gathered information. Since these activities of information seeking are specifically dependent upon task-solving and social information, which is subjective and reliant upon experiences and specific project contexts, content generated by peers or supervising employees on social intranet sites is expected to be highly valuable. Taking into consideration the innate conflict of weighing quality of information and people enablement against the reusability of information and work efficiency, senior executives and project manager consider these types of applications to support the externalization and exchange of information better than in bilateral conversations.

As a result, Figure 53 consolidates the identified potential of social software as a source of information in the workplace of management consulting. The outer frame of the visualization captures the overall value external and internal social software applications may offer by supporting young professionals in building awareness of existing activities, knowledge, experts and experiences within or outside of the firm. The inner frame focuses on the different stages of information seeking when young professionals are confronted with a new information-related work task. As the results presented in section 6.2 have shown that the daily work tasks of analysts and consultants are most commonly perceived to be investigative decision tasks, the respec-

tive process of the context-specific model (see figure 36) has been included. The above formulated potential benefits of external wikis and social intranet sites are placed along those phases of task-based information seeking (marked in blue), where young professionals might best be supported by the respective types of social software as an information source.

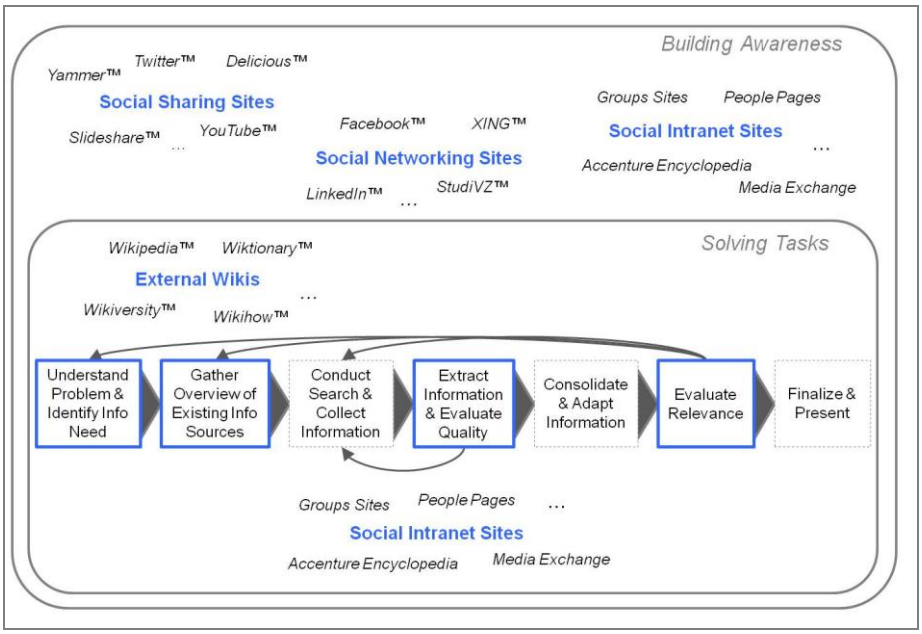


Figure 53 Social Software as a source of information in management consulting

Concluding the discussion of potential benefits of social software as a source of information in the workplace of management consulting, the participants expressed the expectation that these types of applications would be specifically adopted by members of the *net generation.*

7.3 Critical assessment from a leadership perspective and identification of context-specific challenges

As it was argued before, understanding the way young professionals approach new tasks in their daily consulting work, the characteristics of the workplace environment and complexity of such tasks and the usage of traditional information sources provides the basis for identifying the potential of social software to serve as a source of information in a certain professional context and how it may be further leveraged in the future. The presented considerations were therefore confronted with the actual usage behavior as observed and surveyed in chapters 5 and 6. This aimed at identifying unleveraged potential from a leadership perspective and reflecting possible context-specific challenges and conflicting interests.

7.3.1 Discussion of the actual usage behavior of young professionals

First of all, the participants of the workshop were confronted with the study results of the online survey regarding the workplace environment and perceived task complexity (see section 6.2). These have shown that analysts and consultant in management consulting spend most of their working hours at a client site, working on client-related tasks, which they perceive to be rather unstructured and fairly complex. They rely on their personal computer and the corresponding electronic information environment for almost all of their task-solving activities. The expert discussion revealed that this met the expectations and personal observations from the perspective of project and divisional management. The reported high degree of task complexity was considered a natural, partly intended aspect of typical work roles in management consulting. It was noted, however, that the subjective evaluation of the participants' tasks may be slightly falsified by a 'social desirability' bias, since it may be the positive self-conception of job entrants to be dealing with complex work tasks. Moreover, the reported fairly high degree of self-initiation of tasks was considered critically. From a leadership perspective young professionals are given rather little room for self-initiated work tasks and mostly driven by work instructions from their direct project supervisors or

client counterparts. This may also explain the large degree of uncertainty that was reported to characterize the beginning of new tasks. It is often challenging for young analysts and consultants to understand what the client or supervisor means and needs when assigning a task.

The way traditional information sources[61] are used by the participants of the study in order to support their task-solving efforts in general (see section 6.4.1) and as support of the identified activities of information seeking in specific (see section 6.4.2) conform to the expectations and personal observations of the leadership to a large degree. The high importance of personal contacts as sources of information was considered to be somewhat self-evident for the field of knowledge-intensive business services and even desirable from a quality perspective. Since management consultants are heavily dependent upon methodical skills and experiences from previous project engagements, clients and industries, senior subject matter experts are expected to provide young job entrants with guidance and quality assured information. Regarding the distribution of usage of information sources along the identified process of task-based information seeking the reliance upon expert opinions in the phases of 'understanding the problem & identifying the information need' and 'extracting information & evaluating quality' were assessed positively in regards to quality and standardization of information. This, however, was considered a double-edged sword, since quality concerns on the one hand stand in conflict with leadership objectives regarding the workforce's efficiency on the other hand. Thus, the participants of the workshop commented critically that senior subject matter experts in the company are often overstretched with vast amounts of inquiries from less experienced colleagues. Furthermore, they complained that most of the requests were uttered via e-mail, which means for the questions as well as answers to remain hidden to other colleagues and cause a communicative overload that decreases their own productivity. This is even more the case since young colleagues often require more than just a short answer or document but rather extensive explanations in order to satisfy their information needs. The image of 'teaching how to fish instead of simply giving a fish' was used by one of the senior executives to express the ideal of enabling junior colleagues to

61 This refers to all the available sources of information except emerging social software applications: personal contact sources, personal hard drive / team network drives, intranet knowledge sources, factual internet sites, printed factual sources, instructed training sources, and internet search engines.

develop new skills instead of simply providing the right answer. If it was for people development, the primary goal would be to transfer task-solving and social information relevant for developing new experts. Since the management consulting domain is especially characterized by a dynamic and time-critical work environment, however, client satisfaction and delivery of solutions oftentimes are of higher priority. An anecdotal example of this conflict of interests was given as a situation where one of the participating senior executives was contacted by a junior colleague and asked for the calculation of costs and efforts for a certain project and scope. While it would have been desirable to explain the young colleague how such a calculation is done and what needed to be taken into consideration in order to allow for industry- and client-specific parameters, he needed to present the client with a figure on short notice and thus did not have enough time so that only factual information could be transferred. It was commented that situations like these also meant that the individual would soon be in a similar situation and have to contact the senior expert again instead of being able to solve the task independently. This switch of perspectives from the 'receiving' to the 'giving' part of this information process provided further critical insights into aspects of expected availability and immediacy of replies.

From a leadership point-of-view another critical aspect about the information seeking behavior of young professionals as described in section 6.4.2 was identified: the frequent use of information that is stored on personal hard drives and existing local document collections, especially when 'gathering an overview of existing information sources' and 'conducting a search & collecting information'. While this was accepted to be a common behavior of senior colleagues, it posed certain concerns in regarding the quality, degree of innovativeness and standardization of the retrieved information for rather inexperienced employees. If analysts or consultants did not know the answer to a certain problem, searching the own hard drive may hardly be considered helpful. That is why the participants of the workshop pointed out that intranet knowledge sources and factual internet sites should play a much larger role than, e.g., personal hard drives and possibly internet search engines. In particular, the internal *Knowledge Exchange* was considered to be a dedicated source of high quality and relevant information for common work tasks in management consulting that should be used more frequently. The observation that this is not reflected in the information seeking and source usage behavior of young professional was interpreted as an indication for a lack of structure and effective communication of the relevance of such preferred sources of

information. If all the information that is available in IKS was connected better across the different sources of information and presented with more context information, it would have the potential to be used as primary point of reference by young professionals. The reported low usage of such intranet sources, however, was also considered to be an expression of a certain 'consumer mindset' on behalf of analysts and consultants. The high usage of local document collections, personal contacts and internet search engines was seen as the intention to avoid effort and uncertainty, since information retrieved from these sources promises to be easily accessible and validated (as in the case of PCS and PHD). This led to the earlier described critique that, especially when collecting information and evaluating its quality, intranet knowledge sources are not used frequently enough from a leadership perspective.

As a final critical assessment of the study results, the overall variety of information sources used by job entrants in order to gather an overview of existing information sources, conducting a search and collecting information was considered to indicate a certain overload of available tools and reveal the need for a structured communication of available sources and their benefits as well as the overall convergence of sources.

7.3.2 Identification of context-specific challenges and reflection of leadership interests

The previously described critical assessment of the actual information seeking and source usage behavior of young professionals in management consulting reveals a gap between the supposed value of social software as a source of information in the workplace and its current realization by the respondents of the study. As the results presented in section 6.4.3 have exposed, the participating young professionals indeed show a high degree of familiarity with the social web and use it quite frequently for private purposes. However, the earlier uttered expectations that this may lead to the acceptance of social intranet sites and other social software applications as sources of information for professional purposes could not be confirmed. Still, the reported gap between the high usage of social web applications for private purposes and the low acceptance of social intranet applications for professional purposes did not surprise the participants of the leadership workshop. On the one hand, their own observations partly confirmed that young job entrants in particular seemed to endeavor to primarily rely upon

traditional information sources. On the other hand, it was commented that the unambiguousness of results might also be explained by a 'social desirability' bias, since the threat of disclosing professional or confidential information when using social web applications for professional purposes had been clearly communicated by the leadership. Thus, it may be assumed that there is a certain albeit negligible degree of social web usage in the workplace that was not reflected in the results of the quantitative study.

The further focus of discussion aimed at the overall usage of social intranet sites and the social web for professional purposes. The low acceptance of these applications as sources of information was considered to be alarming from a leadership perspective, since all of the above mentioned benefits may not be realized. The fact that these sources of information are used only seldom by young professionals in management consulting may be explained by possible context-specific challenges in regards to:

- the effective communication of the benefits of the various internal social software applications,
- the accessibility of tools and appropriate enablement of young job entrants,
- the availability of a critical mass and clear structure of content,
- sufficient efforts among members of the corporate leadership to reduce existing reservations and fears of younger and less experienced employees,
- the establishment of low-thresholds for participation and usage,
- and in general a more consequent implementation and roll-out of new beta tools and applications.

All of these problem areas were gathered as personal ideas for explaining the low usage of social software applications for professional purposes as reported in section 6.4.3. They do not claim to objectively evaluate the company's central collaboration initiative but represent individual attempts to explain problems in transferring well-accepted social web phenomena into corporate boundaries. As such, they provide essential insights into the consideration of the benefits associated with social software as an information source in the workplace of management consulting as well as the difficulties in realizing them.

In addition to these possible explanations for the unleveraged potential of social web and social intranet sites, the critical assessment of the task-based information seeking and source usage behavior of young professionals also

reveals a certain area of tension. The overall leadership interests with regards to the economic success of the company partly stand in conflict with the paradigm shift the inclusion of social software applications into the workplace information environment means to corporate organizations. While certain characteristic concepts that are unleashed by these types of highly collaborative platforms, such as flat hierarchies, unstructured data, low thresholds to user-generated content and the so-called 'wisdom of the crowds', are considered to be desirable in regards to the exchange of information within the corporate setting, they simultaneously contravene with management interests. The above described considerations regarding the potential of social intranet sites and social web applications have reflected the following leadership concerns:

- quality of work and information,
- control and standardization,
- degree of innovativeness,
- confidentiality,
- qualification and
- effort and efficiency.

The workshop has shown that members of the leadership struggle to find the balance between these organizational interests and the potential value of social software as a source of information in the workplace. Particularly in regards to the information seeking behavior of young professionals, the potential increase in work efficiency or available information by employing social software is confronted with context-specific challenges and conflicting interests. Implementing social intranet sites in order to provide employees with easier access to experiences and opinions from peer colleagues, for example, stands in conflict with the aim of controlling information and a certain degree of quality. Another example is opening the electronic information environment of young professionals to include social web services. While this is considered to provide access to a wider network of experts and valuable social information about specific issues or clients from outside the organization, it threatens the management's urge to guarantee confidentiality and control the information provided to its employees. These examples indicate the overall area of tension identified in regards to the role of social software in the context of management consulting.

7.4 Derivation of exemplary measures for leveraging the use of social software as a source of information in the workplace

The described context-specific challenges have revealed that the potential of including social software meaningfully into the corporate information environment needs to be reconsidered in the light of possible conflicting leadership interests. Thus, a set of measures specific to the participating organization was derived in order to exemplify how the use of social software as an information source in the workplace may be leveraged under certain conditions and constraints in a given workplace environment.

Therefore, the participants of the workshop were asked to identify possible measures that would promise to offer potential solutions for the inclusion of social software in the electronic information environment at the workplace of young professionals and account for the leadership interests highlighted before. The resulting set of exemplary measures was categorized into short-term '*quick wins*' and long-term '*visions*' with respect to their time horizon. Figure 54 provides a first overview of these measures developed for the specific organizational context of *Accenture Management Consulting*.

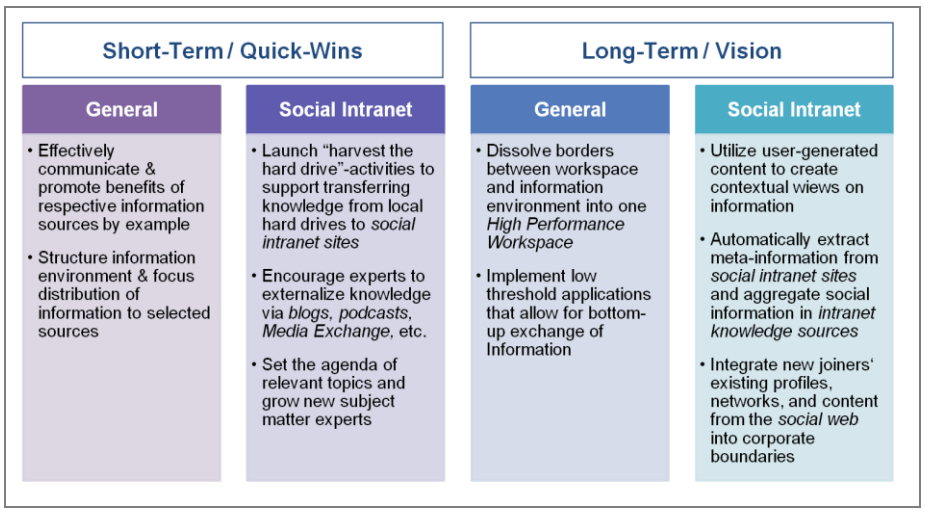


Figure 54
Measures for leveraging the use of social software as a source of information

First of all, general ideas were collected that aimed at improving the overall information environment of young professionals in management consulting . In the short term the leadership representatives proposed to develop a concept for communicating the benefits of each relevant social information source to new joining analysts and consultants more effectively by aligning it along the identified activities of information seeking in the process of solving common work tasks. The gathered insights of this study shall provide useful examples for visualizing what type of information may be found in which information source of the available information environment. This measure coincides with the overall claim for more structure and focus in the current multiplicity of information sources. It was suggested to reduce the large variety of information sources and align the top-down distribution of relevant information by senior leadership to selected preferred points of contact. This shall counteract a certain information overload and the resulting attitude of avoiding efforts and 'information consumption'.

In order to derive measures for improving the usage of social intranet sites and increasing their potential value as a source of information, the participants of the workshop picked up the earlier described criticism of a lacking critical mass and externalization of knowledge. Hence, they proposed to launch so-called 'harvest the hard drive'-activities in order to playfully support the transfer of relevant information from local drives to the internal *Groups Sites* or other social intranet applications. Engaging employees in such a topic-based competition (e.g., hunting for the best project deliverable on project cost estimation) not only increases relevant content on such sites but is also a way of arousing people's attention and visualizing the potential value-add of social intranet sites as sources of valuable information. Another measure with a similar interest was identified to be the targeted encouragement of experts to contribute their expertise via social intranet sites. Accordingly, subject matter experts shall be asked to set up a blog, a podcast series, a video tutorial or simply share a set of status messages with replies to frequently asked questions and typical information needs. Thus, a knowledge transfer from closed e-mail channels towards the rather transparent and searchable social intranet sites shall be achieved. This once again aims at improving the potential of social software applications to serve as an information source in the workplace environment of young professionals in management consulting. Finally, it was discussed that the excessive demands for senior colleagues to share their expertise as personal contact sources may be mitigated in the short term by assigning a central editorial team to identify

relevant topics of interest in order to purposefully encourage junior employees to contribute spontaneous and unfiltered information. This way of setting the 'social intranet agenda' is considered to potentially extend the amount of available information in general and allaying possible fears hindering new experts to make an appearance in social intranet sites.

Apart from these pragmatic short-term measures, the participating senior executives and senior project manager sketched ideas for long-term measures without the usual constraints to possible implementations (e.g., time, existing initiatives and costs). As a result, potential themes for the corporate leadership regarding the improvement of the existing electronic information environment in general and the inclusion of social software as a source of information in particular were identified. Above all, the vision of a 'high performance workspace' that merged all relevant sources of information together with the daily workspace environment of employees guided this final part of the workshop. This concept that has previously been discussed and prototypically developed within the *Talent & Organization Performance* practice of *Accenture Management Consulting* envisions the dissolution of traditional boundaries of applications and tools and replacing them with a 'one-stop-shop' that provides all the information relevant for satisfying an information need as well as all the functionalities required to perform a certain work role. Thus, the borders between work applications and different sources of information dissolve into one holistic and context-sensitive 'performance workspace', where relevant information is provided proactively and combined with aggregated social information from interactions with other colleagues via internal social software.

The ultimate goal of a convergence of information sources is considered to enable different views on information and decrease the need for further clarification with the author of a document. That way both central leadership concerns, quality of information and efficiency of task performance, would be fulfilled. Such context-specific and social views may be achieved in the future by linking the different sources through automatically extracting user-generated content contributed to social intranet sites and embedding the aggregated social information into intranet knowledge sources as well as other social software applications such as *People Pages*.

As a final comment on any of the derived measures for improving the electronic information environment of young professionals in management consulting, the senior executives and senior project manager pleaded for a more consistent and determined implementation of measures and initiatives.

7.5 Summary

The expert workshop with representatives from the senior leadership of *Accenture Management Consulting* provided a critical assessment of the descriptive findings regarding the task-based information seeking behavior of young professionals in management consulting. Identifying the aspired potential of social software and contrasting it with the current usage, furthermore allowed discovering context-specific challenges and reflecting the area of tension between the phenomena of social software and leadership interests. Deriving possible measures for leveraging the use of social software as a source of information for young professionals in management consulting that account for the identified limitations and interests, revealed an exemplary understanding of possible approaches for establishing a '*social electronic information environment*'.

As the documentation of the workshop has revealed, the senior executives and senior project manager share a positive attitude towards social software in general and social intranet sites in particular. There are, however, certain reservations regarding the use of external social web services, particularly concerning the active, i.e., contributing use by young professionals. These positions support the considerations presented in chapter 2. On the one hand, the concepts of virtual collaboration and bottom-up generation of content are considered to provide valuable social information for the task-solving activities of young professionals. On the other hand, the field of management consulting is characterized by a high degree of confidentiality and calls for a certain differentiation between private and professional usage. This leads to the appreciation of the concept of social intranet sites as they promise to the transfer popular phenomena of the social web, which especially young professionals are highly familiar with, into the corporate boundaries of the intranet. The study has revealed, however, that simply copying popular web phenomena and resurrecting them in professional contexts does not necessarily mean transferring the employees' acceptance and willingness to contribute.

Thus, the foundation for any of the identified potential benefits of social software as a source of information is to find ways of activating employees to contribute their knowledge, experiences and opinions within such internal applications as, for example, the *Accenturepedia*, *People Pages* and *Groups Sites*. Nevertheless, regarding the promotion of the active and passive, i.e.,

receptive usage of social intranet sites, different interests from a leadership perspective stand in conflict: while the results and discussions have shown that less structure and low thresholds are required in order to benefit from dynamic, user generated and accordingly social information in the corporate information environment, they have also revealed that more structure of the available content is needed in order to improve the accessibility to relevant high quality information.

The full potential of social software in the workplace, however, does not lie in specific applications but in the type of information that may be collected and distributed by them. Once the critical mass of relevant information is gathered, the benefits of social software as a source of information for building awareness and supporting task-based information seeking behavior need to be communicated clearly and consistently.

The final derivation of exemplary short-term and long-term measures for adapting the electronic information environment of young professionals in the specific organizational context of this study has revealed ways for leveraging the use of social software as an information source from a leadership perspective. As such, they suggest how the required transformation of the workplace environment in order to accommodate the expectations and habitual information seeking patterns of a new generation of employees entering today's organizations may be approached while taking certain limitations due to conflicting interests into consideration.

8 Conclusion

The analytical and empirical steps of this doctoral dissertation have resulted in a variety of findings regarding the characteristics of social software, the information seeking behavior of young professionals and the potential of social software as a source of information in a specific workplace environment. The chosen approach of this thesis has thereby revealed that it is essential to understand the context of use and model the information seeking behavior of the respective study group in order to satisfy the research interest introduced in chapter 1 and identify certain context-specific challenges. The result is a context-specific understanding of the role of social software in the workplace of young professionals as well as exemplary measures for leveraging its use in due consideration of the existence of conflicting interests within corporate organizations in the management consulting domain.

Looking back on the initial considerations of this doctoral dissertation, this chapter summarizes the main findings, their limitations and outlines possible future work. Therefore, it recapitulates the contributions of the conducted empirical study to the research interest of this thesis and the field of INSU research in section 8.1. Furthermore, the validity and limitations of the presented findings will be evaluated in section 1.1 based on considerations regarding the study sample and the chosen scope and perspective. Finally, section 1.1 derives further research needs and indicates next steps required in order to account for the findings of this thesis.

8.1 Contributions

Motivated by the emergence and popularity of new types of web applications and the overall perception, that today's organizations need to adapt their workplace environment to a new generation of employees, it was the research interest of this study to analyze the role of social software as a source of information in the workplace. This was evoked by an all-embracing recognition of the social web phenomena of user-generated content, bottom-up collaboration, social sharing and online social networking in the public as well as academia. Especially in regards to the transfer of such concepts into

corporate boundaries, the idea of weaving social intranets was found relevant and particularly challenging. While social software is often considered from the perspective of knowledge management and collaboration, this study focused on its role as valuable source of information when building awareness and actively seeking information in order to solve highly complex work tasks. It was argued that in order to satisfy this interest, common behavioral patterns of a specific subject group in a specific context needed to be identified. Thus, the information seeking behavior of young professionals in management consulting was observed, conceptualized, surveyed and, finally, analyzed in regards to the potential use of social software applications as sources of information for professional purposes. In the course of these different methodical and analytical steps, the following contributions were made:

First of all, a deep understanding of the task-based information seeking and their influence factors at the workplace of young professionals was reached. As a result, different phases of information seeking were identified that may be observed as a function of the respective type of task. The most common type of task was found to be the investigative decision task, where the type and structure of the result may *a priori* be anticipated, but permanent procedures for performing the task have not yet emerged. Thus, the process is largely unforeseeable and so are its information requirements. Completing such tasks therefore requires a large amount of investigative activities in order to identify the right information sources and extract relevant information in order to found decisions on how to approach the task and create the expected result. Furthermore, four types of information were found to be relevant for the context of management consulting. Apart from the existing concepts of task, factual and task-solving information, a new type of information that defines norms and values relevant for finding and applying the relevant other types of information was identified. This ‘social information’ comprises mainly subjective and evaluative answers to the information requirements that are specific to the cognitive actor (e.g., values and experiences from previous projects of trusted colleagues). Accordingly, it can be found in the social environment of the cognitive actor.

Based on the conceptual understanding of behavioral patterns, central influence factors and the context of management consulting, the use of information sources and their characteristics in the electronic information environment of young professionals was analyzed. Thus, it was shown that analysts and consultants in management consulting use a large variety of information

sources. They most frequently turn to personal contacts, their own personal hard drive, internet search engines and intranet knowledge sources in order solve their common daily work tasks. This usage, however, varies depending upon the type of task they are confronted with and the respective phase of information seeking. Thus, a detailed picture of the relevance of different information sources and the satisfaction with the information environment of the participants of this study was drawn.

This allowed for the identification of the role of social software applications for the common task-based information seeking behavior of young professionals, revealing an ambivalent finding. On the one hand, applications of the social web, such as online social networks, social sharing sites and wikis, receive widespread popularity among members of the *net generation*. On the other hand, social intranet sites with a strictly professional purposes struggle with low usage and acceptance. It has been shown, however, that the various applications provide valuable use cases for serving as sources of information in the workplace environment by providing social information, extending personal networks, building awareness of activities, knowledge and experts within a corporate organization, sustainably visualizing information and communication, sharpening an expert's profile and contextualizing information of intranet knowledge sources so that different views on information may be provided to different users and roles. In regards to the identified context-specific information seeking behavior of young professionals in management consulting, social external wikis and social intranet sites were thus found to serve as potential sources of information in order to support them in understanding the problem and identifying their information need, gathering an overview of existing information sources, extracting information and evaluating its quality and, finally, evaluating the relevance of the gathered information for the respective task at hand. Furthermore, social sharing sites, social networking sites and social intranet sites were generally identified to support building awareness of existing activities, knowledge, experts and experiences within or outside the firm.

Leveraging this potential and successfully transferring the popularity and acceptance of recreational social software use towards a usage for professional purposes, however, remains a central challenge for today's organizations. In the case of *Accenture Management Consulting*, the participating representative of the knowledge-intensive business services sector, a variety of conflicting interests were identified that further complicate realizing the full potential of social software as an information source in the workplace.

Concerns regarding the quality of work and information, ways of controlling and standardizing the information young professionals retrieve, maintaining the confidentiality of client-specific information, efforts of qualifying employees to develop a certain degree of competence and independence and overall interests regarding the increase of efficiency and avoidance of extra efforts, represent important context-specific restrictions that need to be taken into consideration.

Thus, an exemplary set of short-term and long-term measures were identified, which were mainly built around aspects of effective communication, structuring a diverse information environment, improvement of quality and availability (technology and content) and, most importantly, leadership by example. For the respective context of the participating organization, these represent first approaches of how to leverage the use of social web and, most importantly, social intranet sites as sources of information in the workplace of young professionals.

Based on these findings, the research interest (see section 1.1) was addressed and the research questions (see section 1.1) were answered. Furthermore, this doctoral dissertation contributed to two rich fields of scientific research. On the one hand, the developed concepts, theoretical framework, context-specific model of task-based information seeking and the employed methodology contributed to the field of information seeking, needs and use research. By applying the fit-gap analysis as a further development of Makri (2008) to recognized models of information seeking research and by combining qualitative and quantitative methods in order to develop a context-specific questionnaire for modelling and surveying the information seeking behavior of a rarely investigated user group and context of use, this thesis added to a vivid field of research within information science. On the other hand, Schulmeister's demand for further empirical data on the behavioral patterns of young adults in their interaction with a new form of software applications (see section 2.2.3) was upheld. Thus, this thesis also provides additional findings for the demystification of popular conceptions of the *net generation*. There are, however, some limitations to the significance of the findings of this study in this concern, which shall be discussed in the following.

8.2 Limitations

As one central point of departure of this doctoral dissertation, it was the goal to focus on the analysis of the information seeking behavior of young professionals in management consulting who have recently graduated and entered the professional work life. As mentioned earlier, this was an expression of the association of members of the *net generation* with a certain affinity and familiarity with social software applications and the common assumption that they would expect these types of information sources to be included in their workplace information environment. Even though the mean age (27.68 years) and low degree of corporate affiliation (85% < 4 years) of the sample of this study may appear to be well represented, the explanatory power of this study for the target group of young job entrants is slightly limited. Especially since the workforces of management consulting firms are traditionally characterized by high attrition rates and a rather young staff, the sample characteristics show a higher age and amount of years of service than intended for studying young job entrants. The fact that the amount of new joiners in management consulting was limited in the sample of this study may be explained by the economic downturn during the time of recruiting study participants. In the year 2010 not many new hires joined the workforce of the cooperating firm and thus made the access to very young and recent job entrants somewhat more difficult. Still, the leadership assessment of the study's results in chapter 7 and the critical discussion of the common assumptions (and misconceptions) of the *net generation* or *digital natives* has shown, that the findings regarding the potential use of social software as a source of information in the workplace of management consulting are relevant for a much wider target group than only young professionals. Mackenzie (2005) has argued accordingly that no relationship is seen between years of service and information seeking behavior. In her study new, experienced and senior managers all behaved similarly when seeking information. Even though this has to be seen in the specific context of the study focusing on social cooperation processes in the workplace, Mackenzie's work supports the assumption that the findings of this study may also be valid for more experienced subject groups. As it was elaborated in section 4.1, however, employees with a longer corporate affiliation in management consulting are most commonly associated with different work roles on higher career levels and were therefore initially excluded from the study.

Furthermore, common limitations of empirical studies that include such methods as semi-structured interviews and online questionnaires have to be named. As Fidel and Green (2004) have pointed out, such means of data gathering focus on what the participants think rather than what they actually do, as it is not clear how much analysis participants actually carry out when they respond to questions in a questionnaire or an interview. In addition, the retrospective analysis of one's own behavior often appears more structured than it might have actually been. It can be noted, however, that this thesis applied a combination of methods in order to account for the described weaknesses of subjective data from interviews and questionnaires by previously exploring the study context through qualitative observation. Even though this method has also its common limitations, as for example the possible occurrence of the Hawthorne effect, the overall combination of methods aimed at alleviating all of the above mentioned limitations.

Alwis et al. further reviewed Fidel and Green's considerations regarding the focus on a subject group in a specific context by commenting that:

> "[…] these studies need to be carried out in a multi-faceted context of the participants' work and caution that although this method may not allow findings to be immediately generalized, its advantages are that the results are highly relevant to the participants working in that particular context and will enable researchers to compare and contrast across and within the contexts of the information seeking behavior of the different user groups in the future. (Ibid.: 374)

As this study stands in the tradition of previous inductive INSU studies, it derived general conclusions from evaluating a specific context. The context of management consulting as typical element of the knowledge-intensive business service sector in general and *Accenture Management Consulting* as a key representative of this industry are therefore considered to stand for a variety of workplaces of knowledge workers. Regardless of the differences between the various companies in the corporate strategy services provider landscape described in section 4.1, there are certain similarities regarding the workplace environment, work roles, task types and types of information needed as well as the characteristics of young job entrants in these firms. Even though the immediate scope of this study focuses on one of them, the results thus indicate to be applicable on a wider scale.

The identified conflicting management interests and organizational challenges connected with implementing social software in the corporate information environment as well as the derived measures for leveraging its use, however, represent findings that are specific to a certain organization. Even

though some concerns as, for example, in regards to quality and control of information, efficiency and costs and confidentiality may be considered to be common themes for the entire industry of knowledge-intensive business services, they will need to be reconsidered on a case-to-case basis. Thus, the leadership workshop was appropriate for gathering a value-based assessment of the descriptive study results on context-specific information seeking and source usage behavior of a certain share of a company's workforce, but certainly has its limitations in regards to the significance for an objective research perspective. It does, however, point to the fact that the scientific analysis of the potential of social software to serve as a source of information in the workplace also needs to take into account pragmatic concerns driven by economic interest.

8.3 Future work

Based on the described findings as well as the chosen scope and context and limitations of this study, a variety of continuative research questions and areas of future work emerge. First of all, the analysis of existing findings describing the information seeking context of individuals in the workplace environment has led to a variety of genuine concepts, such as task and information types, as well as phases of information seeking, specific to the research interest and scope of this study. Even though these concepts as well as the guiding theoretical framework of the interplay of task and information types and the model of task-based information seeking have proven to serve as valuable foundations for the purpose of this study, they are based on a set of assumptions and evaluations that require further analysis. It would therefore be interesting to examine their validity for other contexts and research questions. Furthermore, the introduction of these considerations and the criticism uttered in section 3.3.3 regarding the identified shortcomings of the analytical/static and summary/process perspective in research literature into the existing INSU community opens a wide field of research questions and possible scholarly discussion that may lead to an enhanced conceptual understanding of patterns regarding the information seeking behavior of cognitive actors. Since this study has focused on the receptive use of information sources from the perspective of an individual user, the findings should also

be joined with such related areas of research as ‘collaborative information seeking’ or ‘social search’.

Furthermore, the distribution of study participants across different regional entities has raised a variety of questions regarding the influence of cultural backgrounds on information seeking behavior in general and the usage of social software applications as sources of information in the workplace environment in particular. There exists a certain amount of research regarding the role of culture on the quality perception of information sources (e.g., De la Cruz et al. 2005), international differences in web page evaluation guidelines (e.g., Mandl/de la Cruz 2009) and cultural differences between web users (e.g., Schmitz et al. 2008). From the perspective of information seeking, needs and use studies, however, there are only few studies that specifically focus on intercultural aspects of information seeking (e.g., Komlodi/Carlin 2004; Komlodi 2005). Particularly in connection with the perspective on collaborative processes of information seeking and such information sources as analyzed in the course of this thesis, the role of national culture as an aspect of a user’s context and information seeking behavior needs to be investigated. The study by Cho and Lee (2008) is a first example of such research revealing a wide field of open research questions.

In regards to the analyzed group of social software and social intranet applications, section 2.1.3 has shown that there is a certain amount of research in different disciplines that deals with this emerging web technology and its associated phenomena. After having set a strong focus on subjective information needs and habitual usage behavior of social software in the course of this thesis, the presented results may extend existing findings of different research disciplines and provide a foundation for a more objective and quantitative view on these types of applications within information science. This may enable the further analysis of the characteristics of user generated content and the relevance of social software as sources of information from a content perspective. There are first quantitative studies concerned with classifying informational content in tweets, status messages and other forms of social software (e.g., Hurlock/Wilson 2011; Hellmann et al. 2010). However, they rarely analyze the workplace context or share the perspective of INSU research on informational values, types of information and the integration into existing models of information seeking behavior.

On another note, prototypical implementations of the here developed short-term measures to improve the corporate information environment and the long-term visions of a boundless performance workspace that integrates

relevant and contextualized information from the variety of information sources scattering today's information environment not only represent future areas of work but would also promise to provide the respective tools for creating and collecting quantitative data, such as a corpus collection of social information or log-files of user interaction.

Finally, this doctoral dissertation has revealed a natural conflict of interests regarding the integration of such web phenomena into the professional environment. Highly contradictory paradigms meet as the organizational (mostly hierarchical) world of editorial, controlled and standardized information provisioning is confronted with the principle of uncontrolled, dynamic, user-generated and social information exchange of the social web. While the present study developed a set of measures for approaching this problem in a specific corporate setting, further research questions regarding the compatibility and consequences of this paradigmatic clash arise.

References

Accenture (2009). Working better together with Accenture Collaboration 2.0: Achieving global high performance through innovative collaboration. Retrieved November 26, 2011, from http://www.accenture.com/SiteCollectionDocuments/PDF/Accenture_Working_better_together_Accenture_Collaboration_20.pdf.

Alexa Internet Inc. (2010). Top Sites: The top 500 sites on the web. Retrieved November 23, 2010, from http://www.alexa.com/topsites.

Allen, T. J. (1969). Information needs and uses. Annual Review of Information Science and Technology, 4, pp. 3–29.

Alwis, G. de, Majid, S. & Chaudhry, A. S. (2006). Transformation in managers' information seeking behaviour: a review of the literature. Journal of Information Science, 32 (4), pp. 362–277.

ALA – American Library Association (1989). Presidential Committee on Information Literacy: Final Report. Chicago, IL, USA: American Library Association. Retrieved September 19, 2008, from http://www.ala.org/ala/acrl/acrlpubs/whitepapers/presidential.htm.

Arjan, R., Pfeil, U. & Zaphiris, P. (2008). Age differences in online social networking. In Czerwinski, M., Lund, A. M. & Tan, D. S. (Eds.), Extended Abstracts Proceedings of the 2008 Conference on Human Factors in Computing Systems, CHI 2008, Florence, Italy, April 5–10, 2008 (pp. 2739–2744). ACM.

ASIS&T (2011): Special Interest Group USE. Information Needs, Seeking and Use, Retrieved April 18, 2011, from http://www.asis.org/SIG/use.html.

ASTD (2010). The Rise of Social Media: Enhancing Collaboration and Productivity Across Generations. An ASTD Research Study. Alexandria, VA, USA: American Society for Training & Development.

Attwell, G. (2006). Social Software, Personal Learning Environments and Lifelong Competence Development. the wales-wide web, Retrieved September 19, 2008, from http://www.knownet.com/writing/weblogs/Graham_Attwell/entries/6665854266/LLLandple.1.rtf.

Baeza-Yates, R. & Pino, J. A. (1997). A first step to formally evaluate collaborative work. GROUP '97: Proceedings of the international ACM SIGGROUP conference on Supporting group work (pp. 56–60). New York, NY, USA: ACM.

Barr, A. & Feigenbaum, E. (Eds.) (1981). Handbook of artificial intelligence. London, UK: Pitman.

Bartlett, J. C. & Toms, E. G. (2005). How is information used? Applying task analysis to understand information use. In Vaughan, L. (Ed.), Data, Information, and Knowledge in a Networked World. The 33rd Annual CAIS/ACSI conference proceedings. The University of Western Ontario, London, Ontario.

Belkin, N. J., Oddy, R. N. & Brooks, H. (1982). ASK for Information Retrieval: Part 1: Background and Theory. Journal of Documentation, 38 (2), pp. 61–71.

Bell, D. J. & Ruthven, I. (2004). Searcher's Assessments of Task Complexity for Web Searching. In McDonald, S. & Tait, J. (Eds.), Lecture notes in computer science. Advances in Information Retrieval (pp. 57–71). Berlin/Heidelberg, Germany: Springer.

Berendt, B., Hotho, A. & Stumme, G. (2010). Introduction: Bridging the Gap-Data Mining and Social Network Analysis for Integrating Semantic Web and Web 2.0. In: Web Semantics: Science, Services and Agents on the World Wide Web, 8 (2–3) (pp. 95–96). Amsterdam: Elsevier Science Publishers B. V.

Bohl, O. & Görtz, M. (2009). How Social software Shifts Existing Paradigms in Corporate Knowledge Management and Learning. Proceedings of the 1st Interdisciplinary Workshop of the Heinrich-Heine-University on "Collaborative Work, Communication and Knowledge Management in Theory and Practice" (SoSoft 09). Düsseldorf, Germany, September 28–29, 2009 (pp. 37–49).

Böhringer, M. & Richter, A. (2009). Adopting Enterprise 2.0: A Case Study on Microblogging. In Wandke, H., Kain, S. & Struve, D. (Eds.), Mensch & Computer 2009. Grenzenlos frei? (pp. 293–302). München, Germany: Oldenbourg.

Borko, H. (1968). Information science: What is it? American Documentation, 19, pp. 3–5.

Boyd, D. M. (2008). Taken Out of Context: American Teen Sociality in Networked Publics. PhD Dissertation. University of California-Berkeley, School of Information, Berkeley, CA, USA. Retrieved November 22, 2010, from http://www.danah.org/papers/TakenOutOfContext.pdf.

Boyd, D. M. & Ellison, N. B. (2007). Social Network Sites: Definition, History, and Scholarship. Journal of Computer-Mediated Communication, 13 (1), article 11. Retrieved September 23, 2010, from http://jcmc.indiana.edu/vol13/issue1/boyd.ellison.html.

Brace, I. (2004). Questionnaire design: How to plan, structure and write survey material for effective market research. Market research in practice. London, UK: Kogan Page.

Brady, M. (2005). Blogging, personal participation in public knowledge-building on the web (Chimera Working Paper No. 2005, 02). Essex, UK: Chimera, University

of Essex. Retrieved September 23, 2010, from http://www.essex.ac.uk/chimera/content/pubs/wps/CWP-2005-02-blogging-in-the-Knowledge-Society-MB.pdf.

Brown, J. S., & Duguid, P. (2000). The social life of information. Boston, Mass.: Harvard Business School Press.

Bruce, C. S. (2002). Information literacy as a catalyst for educational change: a background paper. White Paper prepared for UNESCO, the U.S. National Commission on Libraries and Information Science, and the National Forum on Information Literacy, for use at the Information Literacy Meeting of Experts, Prague, The Czech Republic.

Bruce, H. (2005). Personal, anticipated information need. Information Research, 10 (3) paper 232. Retrieved April 19, 2011, from http://InformationR.net/ir/10-3/paper232.html.

Bruns, A. (2007). Produsage: Towards a Broader Framework for User-Led Content Creation. Creativity & cognition 2007. Seeding creativity: tools media, and environments; CC 2007; June 13–15, 2007, Washington, DC, USA; an ACM SIGCHI conference (pp. 99–105). New York, NY, USA: ACM.

Bundesverband Deutscher Unternehmensberater BDU e.V. (2009). Facts & Figures zum Beratermarkt 2008/2009. BDU-Studie. Bonn, Germany: BDU e.V.

Byström, K. (1999). Task complexity, information types and information sources: Doctoral Dissertation. Tampere, Finland: University of Tampere (Acta Universitatis Tamperensis 688).

Byström, K. (2002). Information and Information Sources in Tasks of Varying Complexity. Journal of the American Society for Information Science and Technology, 53 (7), pp. 581–591.

Byström, K. & Hansen, P. (2005). Conceptual Framework for Tasks in Information Studies. Journal of the American Society for Information Science and Technology, 56 (10), pp. 1050–1061.

Byström, K. & Järvelin, K. (1995). Task complexity affects information seeking and use. Information Processing & Management, 31 (2), pp. 191–213.

Campbell, D. J. (1988). Task Complexity: A Review and Analysis. The Academy of Management Review, 13 (1), pp. 40–52.

Carlin, S., Lee, J., Lemons, D., O'Dell, C. & Swift, G. (2008). The Role of Evolving Technologies: Accelerating Collaboration and Knowledge Transfer. Houston, TX, USA: APQC.

Case, D. (1991). The collection and use of information by some American historians: a study of motives and methods. Library Quarterly, 61 (1), pp. 61–82.

Cheese, P., Thomas, R. J. & Craig, E. (2007). The talent powered organization: Strategies for globalization, talent management and high performance. London, UK: Kogan Page.

Chen, W-Y. (2009). Mining web social data with latent aspect models on distributed computers. Doctoral Dissertation. UC Santa Barbara, CA, USA.

Cheuk, B. W.-Y. (1998). Modelling the Information Seeking and Use Process in the Workplace: Employing Sense-Making Approach. Information Research, 4 (2). Retrieved August 27, 2009, from http://informationr.net/ir/4-2/isic/cheuk.html.

Cheuk, B. W.Y. (1999). A qualitative study in information seeking and use in the professional workplace context: Using the Sense-Making approach. Doctoral dissertation, Nanyang Technological University, Singapore. Advisor, Schubert Foo.

Cheuk, B. W.-Y. (2002). Information Literacy in the Workplace Context: Issues, Best Practices and Challenges. White Paper prepared for use at the Information Literacy Meeting of Experts, Prague, The Czech Republic. UNESCO, the U.S. National Commission on Libraries and Information Science, and the National Forum on Information Literacy.

Choo, C. W. (1993). Environmental scanning: acquisition and use of information by chief executive officers in the Canadian telecommunications industry. Unpublished Ph.D. Thesis. Toronto, Canada: University of Toronto.

Choo, C. W., Detlor, B. & Turnbull, D. (2001). Web work: Information seeking and knowledge work on the World Wide Web (Reprint.). Information science and knowledge management: Vol. 1. Dordrecht, Netherlands: Kluwer Acad. Publ.

Cho, H. & Lee, J. S. (2008). Collaborative information seeking in inter-cultural CMC groups: Testing the influence of social context using social network analysis. Communication Research, 35 (4), pp. 548–573.

Coffey, A. & Atkinson, P. (1996). Making sense of qualitative data: Complementary research strategies. Thousand Oaks, Ca, USA: Sage.

comScore (2010). comScore Releases March 2010 U.S. Online Video Rankings. Retrieved September 28, 2010, from http://comscore.com/Press_Events/Press_Releases/2010/4/comScore_Releases_March_2010_U.S._Online_Video_Rankings/(language)/eng-US.

Cool, C. & Xie, H. (2000). Patterns of Information Use, Avoidance and Evaluation in Corporate Engineering Environment. In Kraft, D. H. (Ed.), Proceedings of the 63rd Annual Meeting of the American Society for Information Science (pp. 473–486). Medford, NJ, USA: Information Today.

Coutaz, J., Crowley, J., Dobson, S. & Garlan, D. (2005). Context is key. Communications of the ACM. 48 (3), pp. 49–53. http://doi.acm.org/10.1145/1047671.1047703.

Crunchbase (2011). MySpace | Crunchbase Profile. Retrieved March 19, 2011, from http://www.crunchbase.com/company/myspace.

D'Monte, L. (2009). Swine flu's tweet tweet causes online flutter. Business Standard. Retrieved December 03, 2010, from http://www.business-standard.com/india/news/swine-flu%5Cs-tweet-tweet-causes-online-flutter/356604/.

Dalsgaard, C. (2006). Social software: E-learning beyond learning management systems. European Journal of Open, Distance and E-Learning, (II). Retrieved August 27, 2008, from http://www.eurodl.org/materials/contrib/2006/Christian_Dalsgaard.htm.

De la Cruz, T., Mandl, Th. & Womser-Hacker, Ch. (2005): Cultural Dependency of Quality Perception and Web Page Evaluation Guidelines: Results from a Survey. In: Day, D., del Galdo, E. & Evers, V. (Eds.). Designing for Global Markets 7: Proceedings of the Seventh International Workshop on Internationalization of Products and Systems (IWIPS 2005). Amsterdam, Netherlands 7–9 July, pp. 15–27.

Deutsches Institut für Normung e.V. (Ed.) (2001). DIN 69901: Projektwirtschaft; Projektmanagement; Begriffe. Berlin, Germany: DIN e.V.

Doniec, A., Hupa, A. & Nielek, R. (2009). Web of Friends- Discovering a Social Network by Mining Data from Instant Messengers. In Proceedings of the 2009 International Workshop on Social Informatics. http://dx.doi.org/10.1109/SocInfo.2009.16.

Du Preez, M. (2008). Information Needs and Information-Seeking Behaviour of Consulting Engineers: A Qualitative Investigation. Master Thesis of Information Science. University of South Africa.

Ebersbach, A., Glaser, M. & Heigl, R. (2008). Social Web. UTB Medien- und Kommunikationswissenschaft Soziologie, Pädagogik, Informatik: Vol. 3065. Konstanz, Germany: UVK Verl.-Ges.

Ehlers, U.-D. (2006). Making the Difference in E-Learning: Towards Competence Development and E-Irritation. In Bernath, U. & Sangrà, A. (Eds.), Research on Competence Development in Online Distance Education and E-Learning. Selected Papers from the 4th EDEN Research Workshop in Castelldefels/Spain, October, 25–28, 2006 (pp. 157–169). Oldenburg, Germany: BIS-Verlag.

Ehrlich, K. & Shami, N. S. (2010). Microblogging Inside and Outside the Workplace. In AAAI (Ed.), ICWSM '10: Proc. of the Int. Conf. on Weblogs and Social Media. (paper 1508). Menlo Park, CA, USA: AAAI Press.

Eisenberg, M. B. & Head, A. J. (2009). Lessons Learned: How College Students Seek Information in the Digital Age. Project Information Literacy Progress Report. The Information School, University of Washington.

Ellis, D. (1989). A behavioural approach to information retrieval system design. Journal of Documentation, 45 (3), pp. 318–338.

Ellis, D. (1993). Modeling the information-seeking patterns of academic researchers: a grounded theory approach. Library Quarterly, 63 (4), pp. 469–486.

Ellis, D. & Haugan, M. (1997). Modelling the information seeking patterns of engineers and research scientists in an industrial environment. Journal of Documentation, 53 (4), pp. 384–403.

Ellison, N., Steinfield, C. & Lampe, C. (2006). Spatially Bounded Online Social Networks and Social Capital: The Role of Facebook. Annual Conference of the International Communication Association, June 19–23, 2006. Dresden, Germany.

Ellison, N., Steinfield, C. & Lampe, C. (2007). The Benefits of Facebook "Friends": Social Capital and College Students' Use of Online Social Network Sites. Journal of Computer-Mediated Communication, 12 (4), article 1. Retrieved September 30, 2010, from http://jcmc.indiana.edu/vol12/issue4/ellison.html.

Erpenbeck, J. & Sauter, W. (2007). Kompetenzentwicklung im Netz: New Blended Learning mit Web 2.0. Köln, Germany: Luchterhand/ Kluwer.

Evans, B. M. & Chi, E. H. (2008). Towards a model of Understanding Social Search. In Soboroff, I., Agichtein, E. & Kumar, R. (Eds.), SSM '08: Proceeding of the 2008 ACM workshop on Search in social media. New York, NY, USA: ACM.

Facebook (2011). Facebook Factsheet. Retrieved March 19, 2011, from http://www.facebook.com/press/info.php?factsheet.

Fagin, R., Kumar, R., McCurley, K. S., Novak, J., Sivakumar, D., Tomlin, J. A. & Williamson, D.P. (2003). Searching the Workplace Web. In Hencsey, G. & White, B. (Eds.), WWW 2003. The twelfth International World Wide Web ; Budapest Convention Centre, 20–24 May 2003, Budapest, Hungary ; proceedings (pp. 366–375). New York, NY, USA: ACM.

Feldman, M. S. (1995). Strategies for interpreting qualitative data. A Sage university paper: Vol. 33. Thousand Oaks, CA, USA: Sage Publ.

Fidel, R. & Green, M. (2004): The many faces of accessibility: engineers' perception of information sources. Information Processing & Management, 40. pp. 563–581.

Fidel, R., Pejtersen A.M., Clean, B. & Bruce, H. (2004). A multidimensional approach to the study of human–information interaction: A case study of collaborative information retrieval. Journal of the American Society for Information Science and Technology, 55 (11), pp. 939–953.

Fisch, M. & Gscheidle, C. (2006). Onliner 2006: Zwischen Breitband und Web 2.0 – Ausstattung und Nutzungsinnovation: Ergebnisse der ARD/ZDF-Online-Studien 1997 bis 2006. Media Perspektiven, (8), pp. 431–440.

Fisher, K. E., Erdelez, S., & McKechnie, L. (Eds.) (2005). Theories of information behavior (1. print.). Medford, NJ, USA: Information Today.

Flanagan, J. C. (1954). The Critical Incident Technique. Psychological Bulletin, 51 (4), pp. 327–358.

Freund, L. (2008). Exploiting Task-Document Relations in Support of Information Retrieval in the Workplace. Doctoral Dissertation. Faculty of Information Studies, University of Toronto. Retrieved June 21, 2010, from http://faculty.arts.ubc.ca/lfreund/Publications/Freund_Luanne_S_200811_PhD_thesis.pdf.

Freund, L. & Toms, E. G. (2005). Contextual Search: from Information Behaviour to Information Retrieval. In Vaughan, L. (Ed.), Data, Information, and Knowledge in a Networked World. Proceedings of the Annual Conference of the Canadian Association for Information Science. The University of Western Ontario, London, Ontario.: CAIS.

Friendster (2010). About Friendster. Retrieved September 28, 2010, from http://www.friendster.com/info/index.php.

Fu, W.-T. & Kannampallil, T. G. (2010). Cognitive models of user behavior in social information systems. CHI EA '10. Proceedings of the 28th international conference extended abstracts on Human factors in computing systems (pp. 4485–4488). New York, NY, USA: ACM.

Gaudin, S. (2009). Study says most companies block Facebook and Twitter: Social networking off limits according to analyst. Retrieved November 25, 2010, from Computerworld US: http://news.techworld.com/personal-tech/3203460/study-says-most-companies-block-facebook-and-Twitter/.

Geraci, J., Peat, B. & Rodos, S. (2006). Meet the Net Generation (NGEN – Big Idea). New Learning Paradigm Corporation.

Gerhards, M., Klingler, W. & Trump, T. (2008). Das Social web aus Rezipientensicht: Motivation, Nutzung und Nutzertypen. In Zerfaß, A., Welker, M. & Schmidt, J. (Eds.), Neue Schriften zur Online-Forschung: Vol. 1. Kommunikation, Partizipation und Wirkungen im Social Web. Grundlagen und Methoden: Von der Gesellschaft zum Individuum (pp. 129–148). Köln, Germany: Halem.

Gibs, J. (2009). Social Media: The Next Great Gateway for Content Discovery? nielsenwire. Retrieved December 01, 2010, from Nielsen: http://blog.nielsen.com/nielsenwire/online_mobile/social-media-the-next-great-gateway-for-content-discovery/.

Gill, K. E. (2004). How can we measure the influence of the blogosphere? Retrieved June 21, 2010, from http://faculty.washington.edu/kegill/pub/www2004_blogosphere_gill.pdf.

Girgensohn, A. & Lee, A. (2002). Making web sites be places for social interaction. CSCW '02: Proceedings of the 2002 ACM conference on Computer supported cooperative work (pp. 136–145). New York, NY, USA: ACM.

Glaser, B. G. & Strauss, A. L. (1967). The Discovery of Grounded Theory: Strategies for Qualitative Research. Hawthorne, NY, USA: Aldine Publishing Company.

Goh, D. & Foo, S. (2008). Social information retrieval systems: Emerging technologies and applications for searching the Web effectively. Hershey, PA, USA: Information Science Reference.

Golder, S. & Huberman, B. A. (2006). Usage Patterns of Collaborative Tagging Systems. Journal of Information Science, 32 (2), pp. 198–208.

Gorman, P. N. (1995): Information Needs of Physicians. Journal of the American Society for Information Science 46 (10), pp. 729–736.

Griesbaum, J. (2007). Mehrwerte des Kollaborativen Wissensmanagements in der Hochschullehre: Integration asynchroner netzwerkbasierter Szenarien des CSCL in der Ausbildung der Informationswissenschaft im Rahmen des K3-Projekts. Dissertation Fachbereich Informatik und Informationswissenschaft, Universität Konstanz. Konstanz, Germany. [*Zugleich*: 2009 – Schriften zur Informationswissenschaft: Vol. 53. Boizenburg, Germany: vwh Verl. Werner Hülsbusch]

Griesbaum, J. & Kepp, S. (2010). Facilitating Collaborative Knowledge Management and Self-directed Learning in Higher Education with the Help of Social software: Concept and Implementation of CollabUni – a Social Information and Communication Infrastructure. In Tochtermann, K. & Maurer, H. (Eds.), Proceedings of I-KNOW 2010, 10 International Conference on Knowledge Management and Knowledge Technologies. Graz, Austria, September 1–3, 2010 (pp. 415–426).

Grob, H.-L. & Vossen, G. (2007). Entwicklungen im Web 2.0 aus technischer, ökonomischer und soziologischer Sicht (Arbeitsberichte des Kompetenzzentrums Internetökonomie und Hybridität No. 51). Münster, Germany: Institut für Wirtschaftsinformatik der westfälischen Wilhelms-Universität Münster.

Grossman, M. & McCarthy, R. V. (2007). Web 2.0: Is the enterprise ready for the adventure? Issues in Information Systems, VIII (2), pp. 180–185.

Hammwöhner, R. (2007). Interlingual aspects of wikipedia's quality. In Klein, B., Markus, M. & Robbert, M. (Eds.), Proceedings of the 12th International Conference on Information Quality (Vol. 1, pp. 39–49).

Hammwöhner, R., Fuchs, K.-P., Kattenbeck, M. & Sax, C. (2007). Qualität der Wikipedia: Eine vergleichende Studie. In Oßwald, A., Stempfhuber, M. & Wolff, C. (Eds.), Schriften zur Informationswissenschaft: Vol. 46. Open Innovation –

neue Perspektiven im Kontext von Information und Wissen? Proc. 10. Internationales Symposium für Informationswissenschaft (pp. 77–90). Konstanz, Germany: UVK.

Hansen, P. (1999). User interface design for IR interaction: A task-oriented approach. In Aparac, T., Saracevic, T., Ingwersen, P. & Vakkari, P. (Eds.), Digital libraries: Interdisciplinary concepts, challenges and opportunities, Conceptions of the Library and Information Science (CoLIS3) (pp.191–205). Zagreb: Zavod za informacijske studije Odsjeka za informacijske znanosti, Filozofski fakultet; Lovke: Naklada Benja.

Hapke, T. (2007). Informationskompetenz 2.0 und das Verschwinden des „Nutzers". Bibliothek : Forschung und Praxis, 31 (2), pp. 137–149. Retrieved September 15, 2008, from http://eprints.rclis.org/archive/00011689/01/137-149.pdf.

Hargittai, E. (2007). Whose Space? Differences among Users and Non-Users of Social Network Sites. Journal of Computer-Mediated Communication, 13 (1), article 14. Retrieved September 30, 2010, from http://jcmc.indiana.edu/vol13/issue1/hargittai.html.

Hawking, D. (2004). Challenges in Enterprise Search. In Schewe, K.-D. & Williams, H. (Eds.), Vol. 52. ACM International Conference Proceeding Series, Proceedings of the 15th Australasian database conference (ADC 2004) (pp. 15–24). Dunedin, NZ: Australian Computer Society.

Hebecker, E. (2001). Die Netzgeneration: Jugend in der Informationsgesellschaft. Frankfurt/Main, Germany: Campus-Verl.

Heckner, M. & Wolff, C. (2009). Towards Social Information Seeking and Interaction on the Web. In Kuhlen, R. (Ed.), Information: Droge, Ware oder Commons? Wertschöpfungs- und Transformationsprozesse auf den Informationsmärkten ; Proceedings des 11. Internationalen Symposiums für Informationswissenschaft (ISI 2009), Konstanz, 1.–3. April 2009 (pp. 235–241). Boizenburg, Schriften zur Informationswissenschaft: Vol. 51. Boizenburg, Germany: vwh Verl. Werner Hülsbusch.

Hellmann, R., Griesbaum, J. & Mandl, T. (2010). How to find the best User Generated Content. In Abramowicz, W. & Tolksdorf, R. (Eds.), Vol. 47. Lecture Notes in Business Information Processing, 13th International Conference on Business Information Systems (BIS 2010). 3.–5. May, Berlin (pp. 47–58). Berlin et al., Germany: Springer.

Hertzum, M. & Pejtersen, A.M. (2000). The information-seeking practices of engineers: searching for documents as well as for people. Information Processing & Management, 36, pp. 761–778 (18).

Hippner, H. (2006). Bedeutung, Anwendung und Einsatzpotenziale von Social software. In Hildebrand, K. & Hofmann, J. (Eds.), Social Software (pp. 6–16). Heidelberg, Germany: dpunkt.

Hirsh, S. G. (1999). Children's Relevance Criteria and Information Seeking on Electronic Resources. Journal of the American Society for Information Science, 50 (14), pp. 1265–1283.

Hirsh, S.G. (2000). Information needs, information seeking, and communication in an industrial R&D environment. In Kraft, D.H. (Ed.), Proceedings of the 63rd Annual Meeting of the American Society for Information Science, Information Today, Medford, NJ, USA.

Howe, N. & Strauss, W. (2000). Millenials Rising: The Next Great Generation:Vintage Books.

Hu, M. & Liu, B. (2004). Mining opinion features in customer reviews. In Proceedings of Nineteenth National Conference on Artificial Intelligence (AAAI-2004).

Hurlock, J and Wilson, M. L. (2011). Searching Twitter: Separating the Tweet from the Chaff. 5th International AAAI Conference on Weblogs and Social Media (in press).

Ingwersen, P. (1992). Information Retrieval Interaction. London, UK: Taylor Graham.

Ingwersen, P. (1996). Cognitive perspectives of information retrieval interaction: Elements of a cognitive IR theory. Journal of Documentation, 52 (1), pp. 3–50.

Ingwersen, P. & Järvelin, K. (2005). The Turn: Integration of Information Seeking and Retrieval in Context. Springer-11645 / Dig. Serial]: Vol. 18. Dordrecht, Netherlands: Springer.

Järvelin, K (1986). On information, information technology and the development of society: An information science perspective. In Ingwersen, K., Kajberg L. & Pejtersen, M. (Eds.) Information Technology and Information Use: Towards a Unified View of Information and Information Technology. London, UK: Taylor Graham, pp. 35–55.

Järvelin, K., Repo, A. (1983): On the impacts of modern information technology on information needs and seeking. A Framework. In Dietschmann, H. J. (Ed.), Representation and exchange of knowledge as a basis for information processes. Amsterdam: North-Holland, pp. 207–230.

Järvelin, K., & Repo, A. (1984). A taxonomny of knowledge work support tools. In Flood, B., Witiak, J. & Hogan, T. (Eds.), Challenges to an Information Society. Proceedings of the 47th ASIS Annual Meeting (pp. 59–62). White Plains, NY, USA: Knowledge Industry Publications.

Järvelin, K. & Vakkari, P. (1990). Content analysis of library and information science research articles. Library and Information Science Research, 12 (4), pp. 395–421.

Johnson, C. A. (2004). Choosing people: the role of social capital in information seeking behaviour. Information Research, 10 (1), paper 201. Retrieved June 21, 2010, from http://informationr.net/ir/10-1/paper201.html.

Jones, S. & Fox, S. (2009). Generations Online in 2009: Pew Internet & American Life Project.

Julien, H. & Duggan, L. J. (2000). A Longitudinal Analysis of the Information Needs and Uses Literature. Library & Information Science Research, 22 (3), pp. 291–309.

Kelle, U. (2008). Die Integration qualitativer und quantitativer Methoden in der empirischen Sozialforschung: Theoretische Grundlagen und methodologische Konzepte (2. Aufl.). Wiesbaden, Germany: VS Verl. für Sozialwiss.

Kepp, S. & Schorr, H. (2009). Analyzing collaborative learning activities in wikis using social network analysis. Proceedings of the 27th international Conference Extended Abstracts on Human Factors in Computing Systems. Boston, MA, USA, April 04–09, 2009, CHI EA '09 (pp. 4201–4206). New York, NY, USA: ACM.

Kim, J. (2009). Describing and predicting information-seeking behavior on the Web. Journal of the American Society for Information Science and Technology, 60 (4), pp. 679–693.

Kirton, J. & Barham, L. (2005). Information literacy in the workplace. The Australian Library Journal, 54 (4). Retrieved November 09, 2008, from http://www.alia.org.au/publishing/alj/54.4/full.text/kirton.barham.html.

Klamma, R., Chatti, M. A., Duval, E., Hummel, H., Hvannberg, E. T., Kravcik, M., Law, E., Naeve, A. & Scott, P.(2007). Social software for Life-long Learning. Educational Technology & Society, 10 (3), pp. 72–83.

Klatt, R., Gavriilidis, K., Kleinsimlinghaus, K. & Feldmann, M. (2001). Nutzung elektronischer wissenschaftlicher Information in der Hochschulausbildung: Barrieren und Potenziale der innovativen Mediennutzung im Lernalltag der Hochschulen. Retrieved November 06, 2008, from http://www.stefi.de/download/kurzfas.pdf.

Komlodi, A. & Carlin, M. (2004). Identifying cultural variables in information-seeking behavior. Proceedings of the Tenth Americas Conference on Information Systems (AMCIS). New York, NY, USA: Association for Information Systems, pp. 477–481.

Komlodi, A. (2005). Cross-cultural study of information seeking. Proceedings of the International Conference on Human-Computer Interaction (HCII 2005), First International Conference on Usability and Internationalization. Berlin; New York, NY, USA: Springer-Verlag. CD-ROM.

Koper, R. & Specht, M. (2006). Ten-Competence: Lifelong Competence Development and Learning. In Cicilia, M.-A. (Ed.), Competencies in Organizational e-learning: concepts and tools (pp. 230–247). Hershey, PA, USA: IGI-Global.

Krauss, D. (2009). Market Overview: The Corporate Strategy Services Market in 2009. for Vendor Strategy Professionals (Information & Knowledge Management Professional No. 47069). Cambridge, UK.

Kubr, M. (Ed.) (1996). Management Consulting: A Guide to the Profession (3rd ed.). Geneva, Switzerland: International Labour Office.

Kuhlen, R., Seeger, T. & Strauch, D. (2004). Grundlagen der praktischen Information und Dokumentation (5., völlig neu gefasste Ausgabe). München, Germany: Saur.

Kuhlthau, C. C. (1991). Inside the Search Process: Information Seeking from the User's Perspective. Journal of the American Society for Information Science, 42 (5), pp. 361–371.

Kuhlthau, C. C. (1993a). Seeking meaning: A process approach to library and information services. Information management, policy, and services. Norwood, NJ, USA: Ablex Pub. Corp.

Kuhlthau, C.C. (1993b). A principle of uncertainty for information seeking. Journal of Documentation, 49 (4), pp. 339–355.

Kuhlthau, C. C. (1999). The Role of Experience in the Information Search Process of an Early Career Information Worker: Perceptions of Uncertainty, Complexity, Construction, and Sources. Journal of the American Society for Information Science, 50 (5), pp. 399–412.

Kuhlthau, C. C. (2004). Seeking meaning: A process approach to library and information services (2. ed.). Westport, Conn., USA: Libraries Unlimited.

Kuhlthau, C. C. & Tama, S. L. (2001). Information Search Process of Lawyers: A Call For 'Just For Me' Information Services. Journal of Documentation, 57 (1), pp. 25–43.

Kuhlthau, C. C., Heinström, J. & Todd, R. J. (2008). The 'information search process' revisited: is the model still useful? Information Research, 13(4), paper 355. Retrieved August 18, 2010, from http://InformationR.net/ir/13-4/paper355.html.

Leckie, G. J., Pettigrew, K. E. & Sylvain, C. (1996). Modeling the Information Seeking of Professionals: A General Model Derived from Research on Engineers,

Health Care Professionals, and Lawyers. The Library Quarterly, 66 (2), 161‑193, Retrieved June 21, 2010, from http://www.jstor.org/stable/4309109.

Lee, D. (1999). Information Seeking and Knowledge Acquisition Behaviors of Young Information Systems Workers: Preliminary Analysis. Proceedings of the 5th Americas Conference on Information Systems (pp. 856–858).

Lenhart, A. (2003). The ever-shifiting Internet population: A new look at Internet access and the digital divide. Washington D.C.: The Pew Internet & American Life Project. Retrieved October 13, 2010, from http://www.pewInternet.org/~/media//Files/Reports/2003/PIP_Shifting_Net_Pop_Report.pdf.

Lenhart, A. & Madden, M. (2007). Social Networking Websites and Teens: An Overview. Pew Internet and American Life Project. Retrieved September 30, 2010, from http://www.pewInternet.org/~/media//Files/Reports/2007/PIP_SNS_Data_Memo_Jan_2007.pdf.

Li, Y. & Belkin, N. J. (2008). A faceted approach to conceptualizing tasks in information seeking. Information Processing & Management, 44 (6), pp. 1822–1837.

Lindner, B. (2008). Der Einsatz von Wikis in der Siemens AG: Wie viele Wikis braucht ein Unternehmen? In Tochtermann, K. & Maurer, H. (Eds.), Praxisforum I-KNOW ’08. 8th International Conference on Knowledge Management .

LinkedIn (2010). About Us: Latest LinkedIn Facts. Retrieved September 25, 2010, from http://press.linkedin.com/about.

Liu, J., Cole, M. J., Liu, C., Bierig, R., Gwizdka, J., Belkin, N. J., Zhang, J. & Zhang, X. (2010). Search behaviors in different task types. JCDL ’10: Proceedings of the 10th annual joint conference on Digital libraries (pp. 69–78). New York, NY, USA: ACM.

Lusoli, W. & Miltgen, C. (2009). Young People and Emerging Digital Services: An Exploratory Survey on Motivations, Perceptions, and Acceptance of Risks. Seville, Spain: JRC Scientific and Technical Reports.

Makri, S. (2008). A study of lawyers’ information behaviour leading to the development of two methods for evaluating electronic resources. Doctoral Thesis, UCL (University College London), Retrieved April 19, 2011, from http://eprints.ucl.ac.uk/14729/.

Mandl, Th. & de la Cruz, T. (2009). International Differences in Web Page Evaluation Guidelines. International Journal of Intercultural Information Management (IJIIM), 1 (2), pp. 127–142.

Marchionini, G. (1995). Information seeking in electronic environments. Cambridge, UK: Cambridge Univ. Press.

Marchionini, G. (2006). Exploratory search: from finding to understanding. Communications of the ACM, 49 (4), pp. 41–46.

Marenzi, I., Demidova, E. & Nejdl, W. (2008). LearnWeb 2.0: Integration Social software for Lifelong Learning. In Luca, J. & Weippl, E. R. (Eds.), Proceedings of ED-MEDIA 2008. World Conference on Educational Multimedia, Hypermedia and Telecommunications (pp. 1793–1802). Chesapeake, VA, USA: AACE.

Mashable (2011). What makes China's Top 4 social networks tick? Retrieved March 19, 2001, from http://mashable.com/2011/03/18/china-top-social-network/

Mannheim, K. (1928/29). Das Problem der Generationen. In Kölner Vierteljahreshefte für Soziologie 7, pp. 157–184. partly reprinted in Kohli, M. (Ed.) (1978): Soziologie des Lebenslaufs. Darmstadt/Neuwied Germany, pp. 33–53.

Maßun, M. (2009). Collaborative information management in enterprises. Schriften zur Informationswissenschaft: Vol. 52. Boizenburg, Germany: vwh Verl. Werner Hülsbusch.

McAfee, A. (2006). Enterprise 2.0 – The Dawn of Emergent Collaboration. MIT Sloan Management, 47 (3), pp. 21–28.

McDonald, S. (2005). Studying actions in context: a qualitative shadowing method for organizational research. Qualitative Research, 5 (4), pp. 455–473.

Miles, I., Kastrinos, N., Flanagan, K., Bilderbeek, R. & den Hertog, P. (1995). Knowledge-intensive business services: Users, carriers and sources of innovation. (EIMS No. 15). Manchester, UK: PREST.

Milgram, S. (1967). The Small World Problem. Psychology Today, 2, pp. 60–67.

Miller, V. D. & Jablin, F. M. (1991). Information Seeking during Organizational Entry: Influences, Tactics, and a Model of the Process. The Academy of Management Review, 16 (1), pp. 92–120.

Mintzberg, H. (1970). Structured Observation as a Method to Study Managerial Work. Journal of Management Studies, 7 (February 1970), pp. 87–104.

Mislove, A., Marcon, M., Gummadi, K. P., Druschel, P. & Bhattacharjee, B. (2007). Measurement and Analysis of Online Social networks. Proceedings of the 5th ACMUSENIX Internet Measurement Conference (IMC '07),

Morris, M.R.; Teevan, J. & Bush, S. (2008): Enhancing collaborative web search with personalization: groupization, smart splitting, and group hit-highlighting. CSCW '08: Proceedings of the 2008 ACM conference on Computer supported cooperative work. (pp. 481–484). New York, NY, USA: ACM.

Morris, M. R., Teevan, J. & Panovich, K. (2010). What do people ask their social networks, and why? A survey study of status message Q&A behavior. CHI '10: Proceedings of the 28th international conference on Human factors in computing systems (pp. 1739–1748). New York, NY, USA: ACM.

Morrison, E. W. (1993). Newcomer Information Seeking: Exploring Types, Modes, Sources, and Outcomes. The Academy of Management Journal, 36(1), 557–589, Retrieved June 21, 2010, from http://www.jstor.org/stable/256592.

Mühlbacher, S. (2009). Information literacy in enterprises. Schriften zur Informationswissenschaft: Vol. 51. Boizenburg, Germany: vwh Verl. Werner Hülsbusch.

Müller, C. (2008). Analyse der Wissenskommunikaton in Wiki-basierten Netzwerken. In Zerfaß, A., Welker, M. & Schmidt, J. (Eds.), Neue Schriften zur Online-Forschung: Vol. 1. Kommunikation, Partizipation und Wirkungen im Social Web. Grundlagen und Methoden: Von der Gesellschaft zum Individuum (pp. 348–369). Köln, Germany: Halem.

Muller, E. & Doloreux, D (2007). The key dimensions of knowledge-intensive business services (KIBS) analysis: a decade of evolution. (Working Papers Firms and Region No. U1/2007). Fraunhofer ISI. Retrieved February 21, 2011, from http://econstor.eu/bitstream/10419/29335/1/610017543.pdf.

Müllner, U. (2008). Lernplattformen in Unternehmen: Von der Lernplattform zur integrierten Lernumgebung im Arbeitsprozess. Saarbrücken, Germany: VDM Verlag Dr. Müller.

Nardi, B. A., Schiano, D. J., Gumbrecht, M. & Swartz, L. (2004). Why we blog. Communications of the ACM, 47 (12), pp. 41–46.

Nations, D. (2010). Business Social Networks: A List of Business Social Networks for Professionals. About.com: Web Trends. Retrieved September 25, 2010, from http://webtrends.about.com/od/socialnetworks/tp/business-social-networks.htm.

Notess, M. (2004). Three looks at users: A comparison of methods for studying digital library use. Information Research, 9(3). Retrieved April 19, 2011, from http://informationr.net/ir/9-3/paper177.html.

O`Reilly, T. (2005). What is Web 2.0: Design Patterns amd Business Models for the Next Generation of Software. Retrieved October 11, 2008, from http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html.

Oblinger, D. & Oblinger, J. L. (2005). Is It Age or IT: First Steps Toward Understanding the Net Generation. In Oblinger, D. & Oblinger, J. L. (Eds.), Educating the net generation (pp. 2.2–2.20). Boulder, CO, USA: EDUCAUSE.

Orton, R., Marcella, R. & Baxter, G. (2000). An observational study of the information seeking behaviour of Members of Parliament in the United Kingdom, Aslib Proceedings 52 (6), pp. 207–217.

Owen, M., Grant, L., Sayers, S. & Facer, K. (2006). Social software and learning. Opening Education. Retrieved May 21, 2008, from www.futurelab.org.uk/resources/documents/opening_education/Social_Software_report.pdf.

Paisley, W.J. (1968) Information needs and uses. Annual Review Information Science and Technology. 3, pp. 1–30.

Palfrey, J. & Gasser, U. (2008). Born digital: Understanding the first generation of digital natives. New York, NY, USA: Basic Books.

Peters, I. (2009). Folksonomies: Indexing and Retrieval in Web 2.0. Knowledge and Information: Vol. 1. Berlin, Germany: de Gruyter Saur.

Pirolli, P. (2009). An elementary social information foraging model. CHI '09: Proceedings of the 27th international conference on Human factors in computing systems (pp. 605–614). New York, NY, USA: ACM.

Pirolli, P., & Card, S. K. (1999). Information Foraging. Psychological Review, 106, pp. 643–675.

Prensky, M. (2001). Digital Natives, Digital Immigrants: Part 1. On the Horizon, 9 (5), 1–6. Retrieved October 13, 2010, from DOI:10.1108/10748120110424816.

Rangaswami, J. P. (2010). The Facebookisation of the enterprise. Confused of Calcutta: A blog about information. Retrieved November 23, 2010, from http://confusedofcalcutta.com/2010/01/02/the-facebookisation-of-the-enterprise/.

Rauch, W. (1988). Was ist Informationswissenschaft? Graz, Austria: Verlag Jos. A. Kienreich (Grazer Universitätsreden).

Reinmann, G. & Eppler, M. J. (2008). Wissenswege: Methoden für das persönliche Wissensmanagement (1. Aufl.). Bern, Switzerland: Huber.

Richter, A., Kneifel, D. & Ott, F. (2009). Fallstudie: Social Networking bei Accenture. Wirtschaftsinformatik & Management, 1 (1), pp. 78–81.

Richter, A. & Koch, M. (2009). Zum Einsatz von Social Networking Services in Unternehmen. In Hansen, H. R., Karagiannis, D. & Fill, H.-G. (Eds.), Business Services: Konzepte, Technologien, Anwendungen. Proceedings 9. Internationale Tagung Wirtschaftsinformatik (Vol. 1, pp. 851–860). Österreichische Computer Gesellschaft.

Riemer, K. & Richter, A. (2010). Tweet Inside: Microblogging in a Corporate Context. 23rd Bled eConference, eTrust: Implications for the Individual, Enterprises and Society (pp. 1–17).

Rosa, C. de (2007). Sharing, privacy and trust in our networked world: A report to the OCLC [Online Computer Library Center] membership. Dublin, Ohio: OCLC.

Rowe, M. (2010). The credibility of digital identity information on the social web: a user study. WICOW '10: Proceedings of the 4th workshop on Information credibility (pp. 35–42). New York, NY, USA: ACM.

Russell, M. (2011). Mining the Social Web: Analyzing Data from Facebook, Twitter, LinkedIn, and Other Social Media Sites. O'Reilly Media.

Sackmann, R., & Weymann, A. (1994). Die Technisierung des Alltags: Generationen und technische Innovationen. Frankfurt/Main, Germany: Campus-Verl.

Schmidt, J. (2007). Social software als Gegenstand und Werkzeug der Online-Forschung. In Welker, M. & Wenzel, O. (Eds.), Neue Schriften zur Online-Forschung: Vol. 1. Online-Forschung 2007. Grundlagen und Fallstudien (pp. 251–272). Köln: Halem.

Schmidt, J. (2008). Was ist neu am Social web? Soziologische und kommunikationswissenschaftliche Grundlagen. In Zerfaß, A., Welker, M. & Schmidt, J. (Eds.), Neue Schriften zur Online-Forschung: Vol. 1. Kommunikation, Partizipation und Wirkungen im Social Web. Grundlagen und Methoden: Von der Gesellschaft zum Individuum (pp. 18–40). Köln, Germany: Halem.

Schmitz, A. K., Mandl, Th. & Womser-Hacker, Ch. (2008). Cultural Differences between Taiwanese and German Web User – Challenges for Intercultural User Testing. International Conference on Enterprise Information Systems (CEIS) (5), pp. 62–69.

Schooley, C. (2005). Get Ready: The Millenials Are Coming! The New Workforce Has Its Own Work Style And Skills (Changing Workforce No. 5). Cambridge.

Schroeder, S. (2009). The Cost of Social Media to Worker Productivity: $2.25 Billion [Survey]. Mashable / Social Media. Retrieved November 25, 2010, from Mashable: http://mashable.com/2009/10/26/social-media-productivity-cost/.

Schulmeister, R. (2009). Gibt es eine Net Generation? Erweiterte Version 3.0. Hamburg, Germany: ZHW Uni Hamburg. Retrieved December 23, 2010, from http://www.zhw.uni-hamburg.de/uploads/schulmeister_net-generation_v3.pdf.

Schulz, J-M., Womser-Hacker, C. & Mandl, T. (2010). Multilingual Corpus Development for Opinion Mining. In: Calzolar, N., Choukri, K., Maegaard, B., Mariani, J., Odjik, J., Piperidis, S., Rosner, M. & Tapias, D. (eds.). Proceedings of the Seventh conference on International Language Resources and Evaluation (LREC 2010). Valletta, Malta: European Language Resources Association (ELRA).

Seufert, S. (2007). Ne(x)t Generation Learning: Was gibt es Neues über das Lernen. In Seufert, S. & Brahm, T. (Eds.), Ne(x)t Generation Learning. Wikis, Blogs, Mediacasts & Co. – Social Software und Personal Broadcasting auf der Spur (pp. 2–19). Universität St. Gallen, Switzerland: SCIL.

Shah, C., Oh, S. & Oh, J. S. (2009). Research agenda for social Q&A. Library & Information Science Research, 31 (4), pp. 205–209.

Siemens, G. (2004). Connectivism: A Learning Theory for the Digital Age. Retrieved October 01, 2010, from http://www.elearnspace.org/Articles/connectivism.htm.

Siemens, G. (2006). Knowing Knowledge: Lulu.com.

Smolnik, S. & Riempp, G. (2006). Nutzenpotenziale, Erfolgsfaktoren und Leistungsindikatoren von Social Software für das organisationale Wissensmanagement. In Hildebrand, K. & Hofmann, J. (Eds.), Social Software (pp. 17–26). Heidelberg, Germany: dpunkt.

Soboroff, I., Agichtein, E. & Kumar, R. (Eds.) (2008). SSM '08: Proceeding of the 2008 ACM workshop on Search in social media. New York, NY, USA: ACM.

Spiegel Online (2010). Konzerne sperren Mitarbeitern Facebook-Zugang. Retrieved November 25, 2010, from http://www.spiegel.de/netzwelt/netzpolitik/0,1518,724990,00.html.

Špiranec, S. & Banek Zorica, M. (2010). Information Literacy 2.0: hype or discourse refinement. Journal of Documentation, 66 (1), pp. 140–153.

Stewart, R. (1965). The Use of Diaries to Study Manager's Jobs. Journal of Management Studies, 2 (2), pp. 228–235.

Strater, K. & Lipford, H. R. (2008). Strategies and struggles with privacy in an online social networking community. BCS-HCI '08: Proceedings of the 22nd British HCI Group Annual Conference on People and Computers (pp. 111–119). Swinton, UK: British Computer Society.

Strauss, W. & Howe, N. (1991). Generations: The history of America's future, 1584 to 2069 (1st Quill ed). New York, NY, USA: Quill.

Summerfield, B. (2007). Executive Briefings: Social networking Blurs Boundaries of Learning. Chief Learning Officer, October. Retrieved May 22, 2008, from http://www.clomedia.com/executive-briefings/2007/October/1937/index.php.

Surowiecki, J. (2007). The wisdom of crowds: Why the many are smarter than the few (reprinted). London, UK: Abacus.

Tapscott, D. (1998). Growing Up Digital: The Rise of the Net Generation. New York, NY, USA: McGraw-Hill.

Taylor, R.S. (1968). Question-negotiation and information seeking in libraries. College and Research Libraries, 29, pp. 178–194.

Toffler, A. (1980). The third wave. New York: Morrow.

Tomaszczyk, A. (2008). Research Note for Response Rates in Web Surveys – Summer 2008. Waterloo: Survey Research Centre, University of Waterloo. Retrieved December 10, 2008, from http://www.src.uwaterloo.ca/Services/Research%20Note%20for%20Response%20Rates%20in%20Web%20Surveys.htm.

Tseng, B.L. (2007). Blog analysis and mining technologies to summarize the wisdom of crowds. In Proceedings of the 8th international workshop on Multimedia data mining: (associated with the ACM SIGKDD 2007). http://doi.acm.org/10.1145/1341920.1341923.

Tully, C. J. (2004). Neue Lernkonzepte in der Informationsgesellschaft?: Eine Einführung. In Tully, C. J. (Ed.), Verändertes Lernen in modernen technisierten Welten. Organisierter und informeller Kompetenzerwerb Jugendlicher (1st ed., pp. 11–24). Schriften des Deutschen Jugendinstituts. Wiesbaden, Germany: VS Verl. für Sozialwiss.

U.S. Department of State Foreign Affairs (2010). 5 FAM 790 USING SOCIAL MEDIA (U.S. Department of State Foreign Affairs Manual Volume 5 – Information Management). Retrieved November 25, 2010, from http://www.state.gov/documents/organization/144186.pdf.

Vakkari, P., Savolainen, R. & Dervin, B. (1997). Foreword. In Vakkari, P. & Savolainen, R. (Eds.), Information seeking in context. Proceedings of an international conference of research in information needs, seeking and use in different contexts, 14–16 August, 1996, Tampere, Finland (pp. 7–13). London, UK: Taylor Graham.

Vakkari, P. (1999). Task complexity, information types, search strategies and relevance: integrating studies on information seeking and retrieval. Information Processing & Management, 35 (6), pp. 819–837.

Vakkari, P. (2003). Task-based information searching. In B. Cronin (Ed.), Annual Review of Information Science and Technology (pp. 413–464). Medford, NJ, USA: Information Today.

Vakkari, P. (2008). Trends and approaches in information behaviour research. Information Research, 13 (4). Retrieved April 18, 2011, from http://informationr.net/ir/13-4/paper361.html.

Väljataga, T. & Fiedler, S. (2008). Competence advancement supported by social media. In Kalz, M., Koper, R., Hornung-Prähauser, V. & Luckmann, M. (Eds.), CEUR Workshop Proceedings. Technology Support for Self-Organized Learners (TSSOL). Salzburg, Austria.

Virkus, S. (2003). Information literacy in Europe: a literature review. Information Research, 8 (4). Retrieved November 09, 2008, from http://informationr.net/ir/8-4/paper159.html.

Walker, C. R., Guest, R. H. & Turner, A. N. (1956). The foreman on the assembly line. Cambridge, Mass., USA: Harvard Univ. Press.

Warning, P., Chu, S. K. W. & Kwan, A. C. M. (2009). Information Seeking And Stopping Among Undergraduate Interns. Proceedings of the 2009 International Conference on Knowledge Management. [CD-ROM]. Hong Kong: Dec 3–4, 2009.

Warr, W. A. (2008). Social software: fun and games, or business tools? Journal of Information Science, 34 (4), pp. 591–604.

Webster, T. (2010). Will Facebook Become The Default Operating System Of the Human Web? Social Media Today. Retrieved September 28, 2010, from http://www.socialmediatoday.com/SMC/191261.

Weinberger, D. (2008). Everything Is Miscellaneous: The Power of the New Digital Disorder. New York, NY, USA: Holt Paperbacks.

Wikimedia (2010). Wikipedia Statistics. Retrieved September 29, 2010, from http://stats.wikimedia.org/EN/Sitemap.htm.

Wilkinson, M. A. (2001). Information sources used by lawyers in problem solving: An empirical exploration. Library & Information Science Research, 23 (3), pp. 257–276.

Williams, J. G. (1997). Information Science: Definition and Scope. In Williams, J. G. & Carbo, T. (Eds.), Information science. Still an emerging discipline (pp. 3–12). Pittsburgh, Pa., USA: Cathedral Publ.

Wilson, T. D. (1997). Information behaviour: an interdisciplinary perspective. Information Processing & Management, 33 (4), pp. 551–572.

Wilson, T. D. (1999). Models in information behaviour research. Journal of Documentation, 55 (3), pp. 249–270.

Wilson, T. D. (2000). Human information behaviour. Informing Science, 3 (2), pp. 49–56.

Wohn, D. Y., Lampe, C., Vitak, J. & Ellison, N. B. (2011). Coordinating the ordinary: social information uses of Facebook by adults. Iconference '11. Proceedings of the 2011 iConference (pp. 340–347). New York, NY, USA: ACM.

Womser-Hacker, Ch. (2010): Was ist Informationswissenschaft? Die Hildesheimer Antwort auf aktuelle Herausforderungen der globalisierten Informationsgesellschaft. In: Perspektiven der Informationswissenschaft. Information – Wissenschaft und Praxis (IWP/nfd), 6–7/2010, pp. 335–340.

Wunsch-Vincent, S. & Vickery, G. (2007). Participative web and user-created content: Web 2.0, wikis and social networking. Paris, France: OECD.

Xie, H. (2006). Understanding human–work domain interaction: Implications for the design of a corporate digital library. Journal of the American Society for Information Science and Technology, 57 (1), pp. 128–143.

Xie, I. (2009). Dimensions of tasks: influences on information-seeking and retrieving process. Journal of Documentation, 65 (3), pp. 339–366.

Zhao, D. & Rosson, M. B. (2009). How and why people Twitter: the role that micro-blogging plays in informal communication at work. GROUP '09: Proceedings of the ACM 2009 international conference on Supporting group work (pp. 243–252). New York, NY, USA: ACM